California Department of Fish and Wildlife Biogeographic Information and Observation System (BIOS 6) User Guide:

The BIOS team in the Biogeographic Data Branch of the California Department of Fish and Wildlife is pleased to release its latest internet-based map and data viewer, BIOS 6. Many new enhancements have been made to the BIOS data viewer and are detailed in this User Guide.

BIOS is a system that enables the visualization of the spatial distribution of biological data generated by the California Department of Fish and Wildlife (CDFW) and its Partner Organizations, the management of those data when necessary, and the sharing of those data with Department employees and partners. It is an evolving system and is expected to change in response to the Department's needs and improvements in technology.

The BIOS Data Viewer is an easy to use, interactive, web-based map viewer that allows basic geospatial viewing and querying without the need for GIS software installed on your computer. It provides a means to manage, archive, display, and analyze information within the scientific and research community and to the general public.

This User Guide is intended to help you become familiar with the components of the BIOS viewer and to provide instruction on the access and use of the many tools and functions available within the viewer.

Contents:

Overview of the Map Viewer:

Upon startup, a welcome screen provides you with information about the viewer and a link to the CDFW Conditions of Use page.

The viewer has four parts, a **Banner** across the top, the **Contents** panel on the left, the **Tools** panel on the right, and the **Map Canvas** in the middle. The **Contents** panel contains any layers you have added to your session and provides other map content related information, such as metadata and symbology for your data layers. The **Tools** panel houses all BIOS tools for interacting with the map and data.
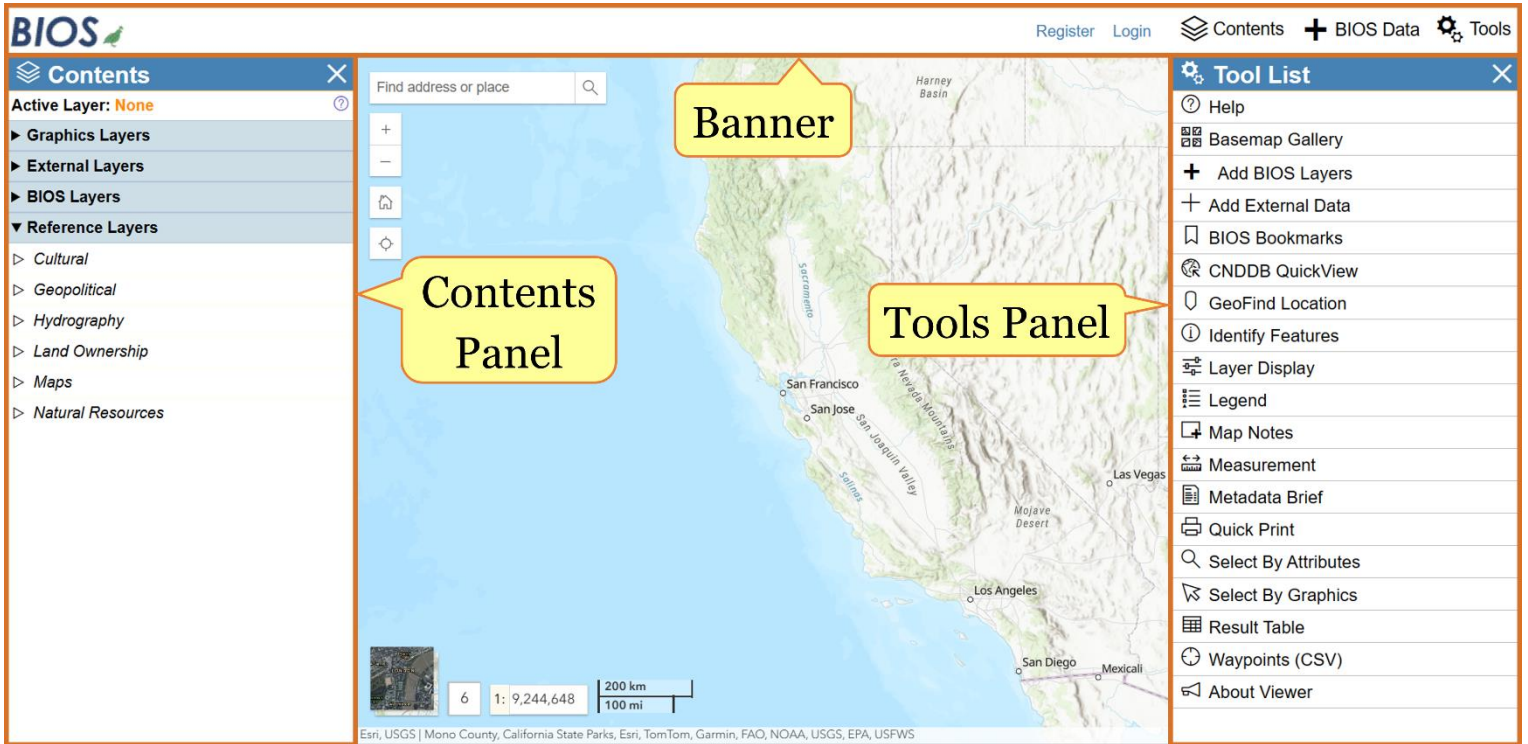
A panel can be closed by clicking on the ✕ button on the upper-right corner. They can be made visible again by clicking on the **Contents** or **Tools** button in the upper right corner of the Banner.

Upon first opening the viewer, a message will be displayed asking for a layer to be made active before a tool can be used. This message can be hidden using the check box.

As a rule of thumb, follow these steps to interact with data in BIOS:

1. **Add a BIOS layer / turn on a reference layer**
2. **Click on the layer to set it as the active layer**
3. **Open a tool to interact with the active layer**

Banner:

Across the top center of the viewer is the **Banner**. This contains the **Tools** button which opens the **Tool List**, the **+ BIOS Data** button which opens the **+ Add BIOS Layers** tool and the **Contents** button which is used to access the **Contents** panel. Each of these buttons opens a panel which occupies space in the Map Viewer.
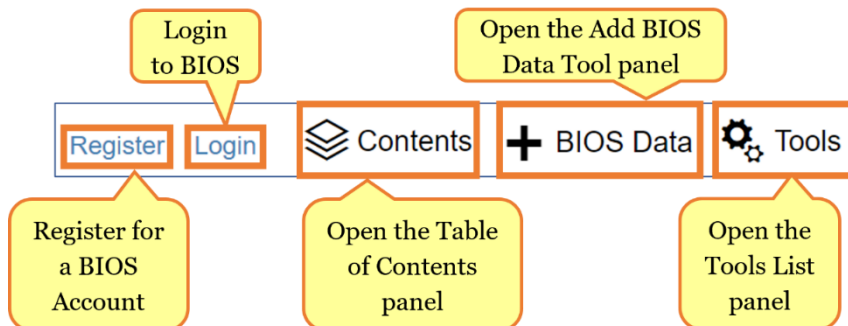
Public vs. Secure Data:

Each dataset in BIOS is assigned a level of security. Most of the datasets are available to the public, but some are restricted for a variety of reasons. You must log in to access the secured datasets. An example of this would be our California Natural Diversity Database (CNDDB), which is available in the BIOS viewer as part of the CNDDB subscription service. (More information is available at the CNDDB website.
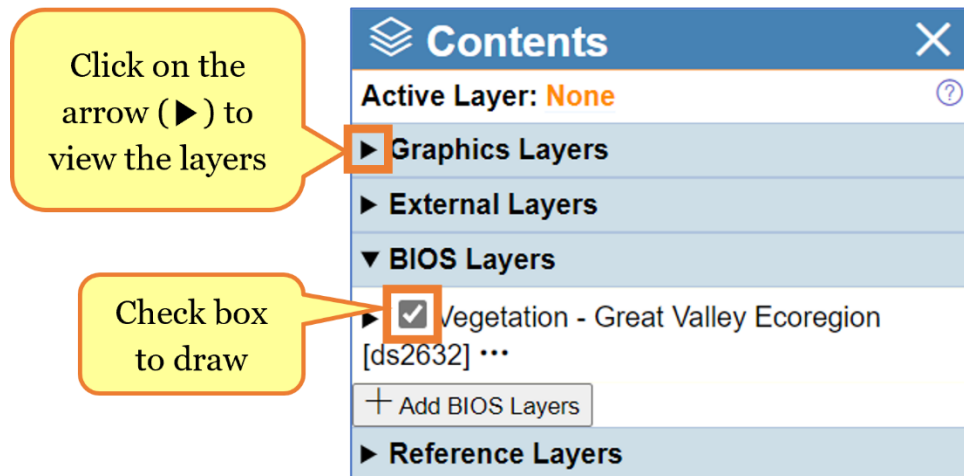
Access to these secure datasets is managed by using assigned usernames and passwords. California Department of Fish and Wildlife (CDFW) users can sign in using their usual Department log in information and CNDDB subscribers can sign in using their CNDDB subscription credentials. You are not required to sign in to access the publicly available datasets, which make up most of the datasets in the BIOS viewer. Sign into the Secure BIOS Viewer to work with secure datasets by clicking the **Login** link in Banner.

Contents:

The **Contents** panel is where the layers added to your BIOS session are managed; it is empty by default. As data are added, they appear in their respective sections. Those sections can be collapsed or reopened by clicking on the right arrow button ►, for example the Graphics Layers or BIOS Layers sections can be opened and closed in this way.

Click on the arrow (►) to view the layers

Check box to draw

Contents

Active Layer: None

► Graphics Layers
► External Layers
▼ BIOS Layers
  ☑ Vegetation - Great Valley Ecoregion [ds2632] •••
  ＋ Add BIOS Layers
► Reference Layers

To draw (turn on) on a data layer, simply check on the small box to the left of the name of the data layer. There are many large and complex datasets in BIOS which do not draw automatically when they are loaded into the map. This gives you a chance to zoom into your area of interest before checking the box to draw the data, improving both the performance of the viewer and the legibility of the data.

Graphics Layers:

The Graphics Layers section lets you manage any selections you have made using tools. A dataset may only have one selection, but each dataset can have its own selection. You can toggle the selection graphic on/off using the checkbox, zoom to the selected features, open the result table, and clear the selection.
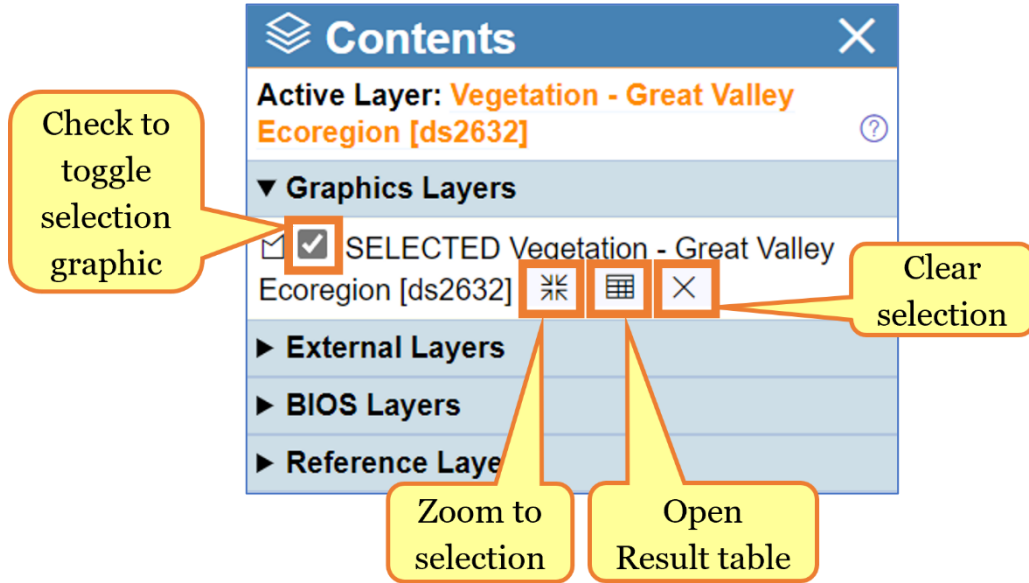

External Layers:

Layers from this section are populated by the + Add External Data tool. You can quickly open the tool from this section. A warning message is displayed in the section informing that CSV, KML, and WMS external data sources cannot be made active, which means BIOS tools do not work with those external data formats.
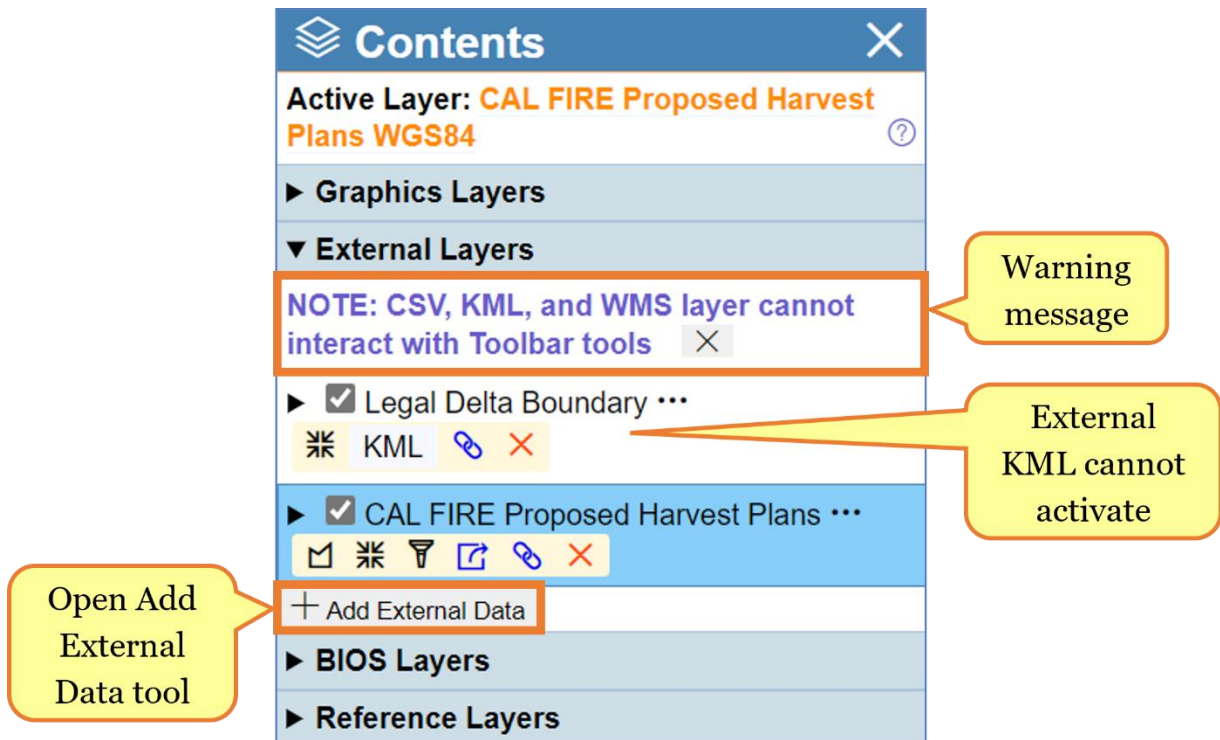
BIOS Layers:

This section contains all data added from the BIOS catalog. The BIOS Layers section also allows for quick access to the **+ Add BIOS Layers** tool by pressing the + Add BIOS Layers button.
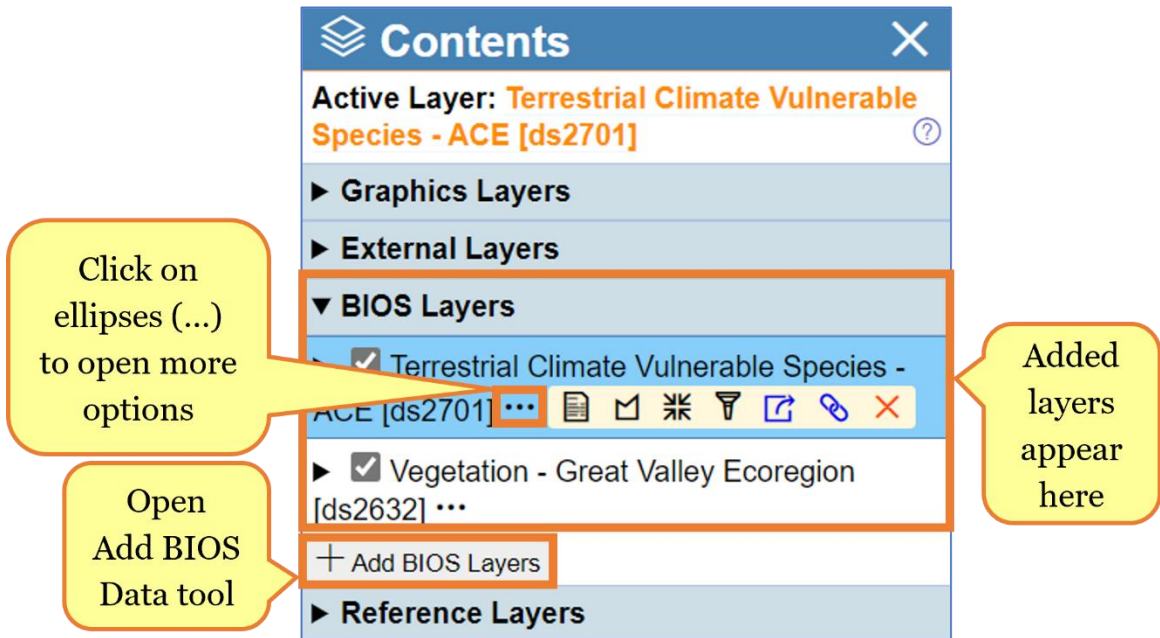
You can view a summary of the metadata for a layer by clicking on three ellipses (…) followed by metadata button ▣ below the layer name. The metadata is displayed in the **Tool** panel on the right side of the viewer. The metadata summary displays the abstract, contact information, a **Download data** button, and a **Complete metadata** button which open the complete metadata in a new web browser window. If you are working with secure data, such as CNDDB, the download button will be inactive, and you will need to contact the contributor to request the data.

The zoom to button ⬚ will allow you to quickly zoom the map to the full spatial extent of the specified Layer.

If a filter is currently applied to a layer the filter button ⬚ will have an orange outline. Clicking on this button will open the **Select By Attribute** tool where the filter can be removed or edited.

Click on the **Remove Layer** button ⬚ to remove the layer from your map session.

A legend is available for each data layer. To view it click on the right arrow button ► to the left of the Layer name to open more options. The right arrow button ► will change to a down arrow button ▼ and **SHOW LEGEND** button ⬚ will appear. Once pressed the drop-down legend will appear. Symbology is not currently editable in BIOS.
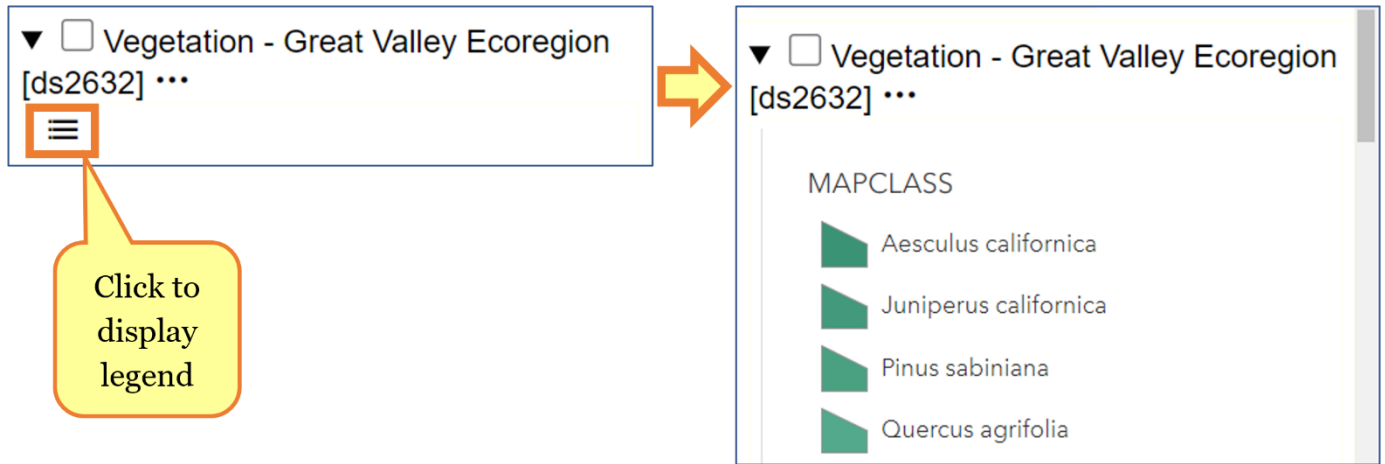
Reference Layers:

The Reference Layers section contains the general-purpose map layers that are provided for geographic reference. These include layers for cities, place names, county boundaries, USGS Quads, US Township/Range/Sections, and many others. The Reference Layers are grouped into categories such as Hydrography and Natural Resources. You can click on the right arrow button ▶ to the left of each category to open it up and see what layers are available in it. These layers have the same functionality as the BIOS Layers, such as the ability to be made active for tool functionality.
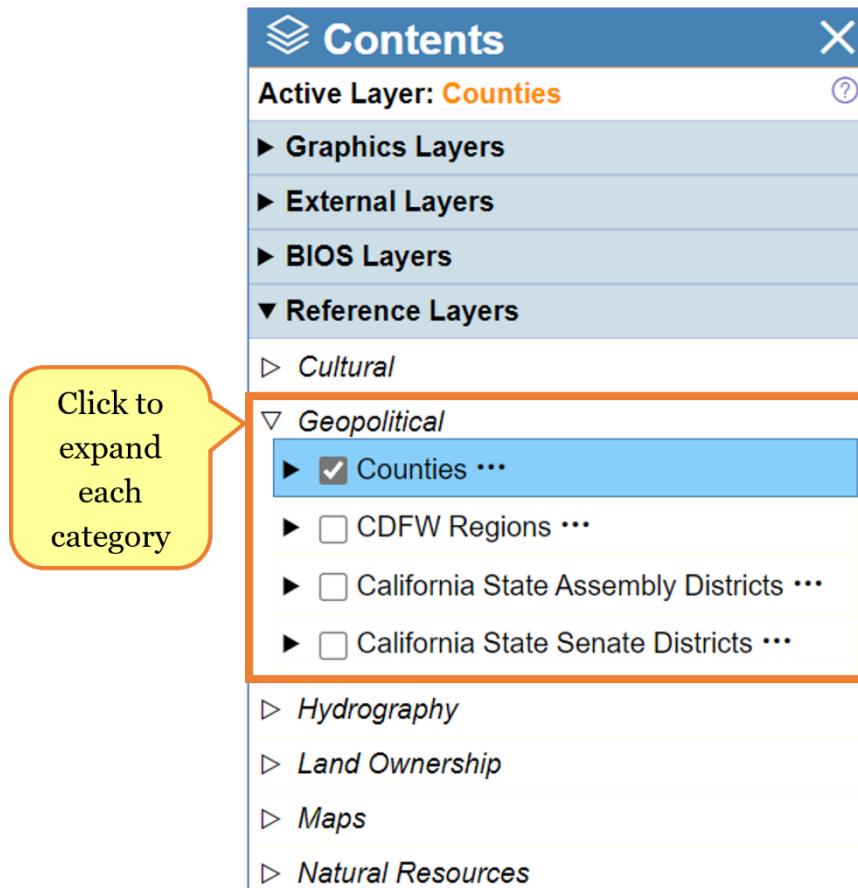
Active Layer Display:

Any of the tools that interact with the data layers will work only on the Active layer. Those tools will list the current Active layer within their interface. To make a layer active you simply click on the layer name in the *Contents* panel. When a layer is active, a blue highlight appears around the layer name and it's listed at the top of the *Contents* panel.
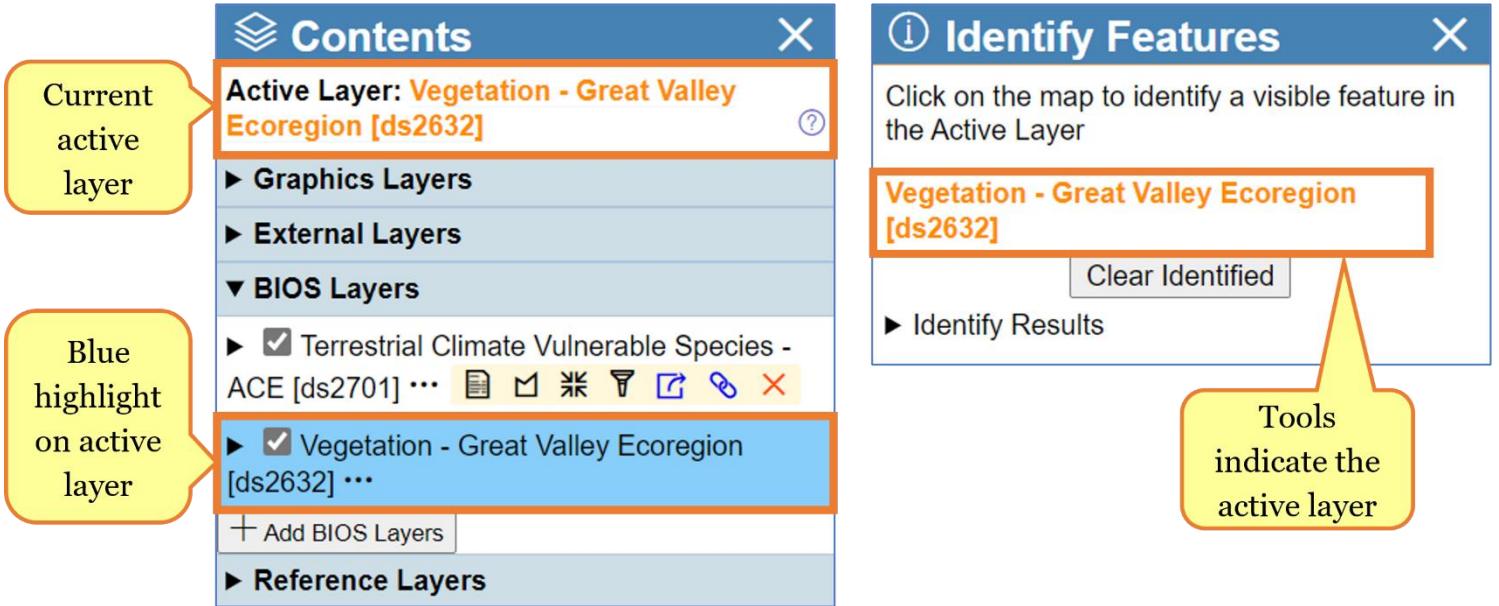
Pop-up Info:

The *Pop-up Info* box returns information on the Active layer. To use this function first activate the layer, then click on a feature in the map. The pop-up will appear in the middle of the map canvas. If multiple items are clicked, toggle through the records for each by using the **Next Feature** button. You can also zoom to a specific record by pressing the **Zoom to** button. The *Pop-up Info* window can be minimized, docked in the upper right corner of the map canvas, or closed by clicking the **Collapse**, **Dock**, and **Close** buttons respectively. If the layer you are working with has related records, you can view them by clicking one of the records at the bottom of the pop-up. To view other related info and/or return to the default pop-up view, click the **Close related record** button.
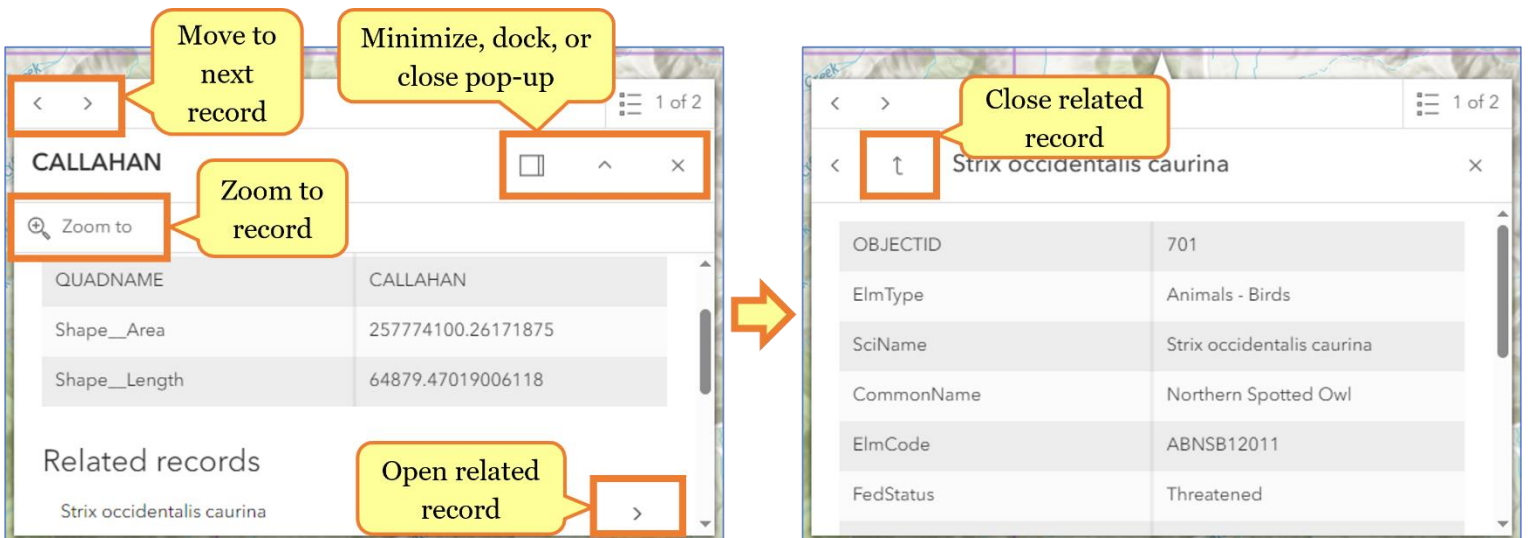
Map Canvas:

In the center, spanning most of the page height and width, is the map canvas. This is where map layer data will be displayed and where you can interact with the data using the provided tools. Panels that run along the side of the viewer (side panels or sidebars) can be minimized to reveal a larger map area.
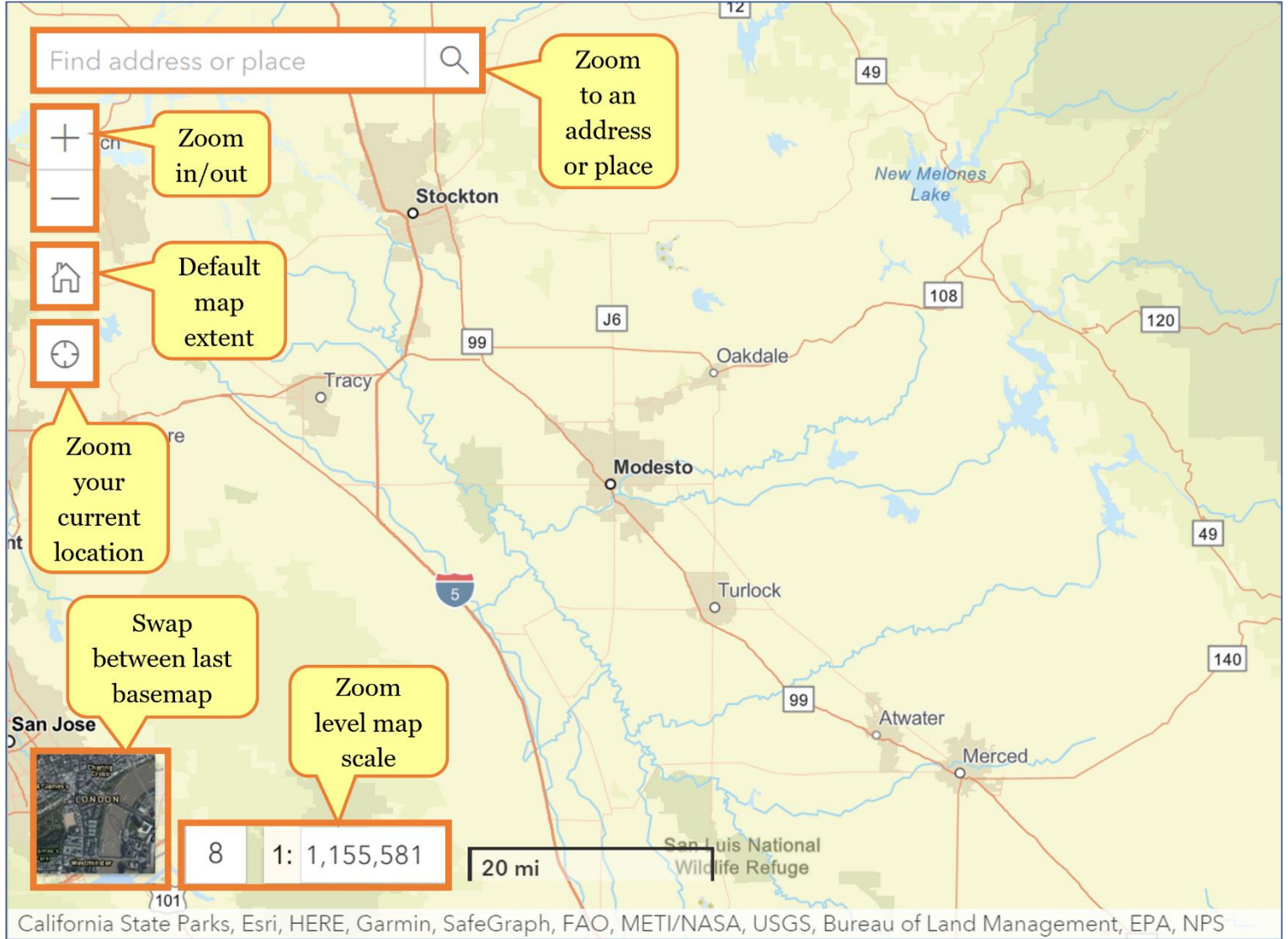
Find Address or Place Search Bar:

Enter an address or location into the search box, then press the Search button or press Enter on your keyboard to quickly zoom to that location.

Zoom Buttons:

Zoom the map view in and out by clicking on the plus and minus buttons. You can also hold the *Shift* key down on your keyboard and use your mouse to draw a box in the map to zoom to the specified area.

Default Map View Button:

To return the zoom level to the default extent, press the Default map view button.

Find My Location Button:

Pressing the Find my location button will attempt to pan the map to your current physical location; you may be prompted by your web browser to access your location information.

Map Scale Text Box:

Scale is a ratio of distance on the map vs. distance on the ground. A ratio of 1:24,000 means 1 inch on map = 24000 inches on ground (about 1/3 mile). Choose from 23 preset map scales in the Zoom Level text box and the map will adjust according to your selection.
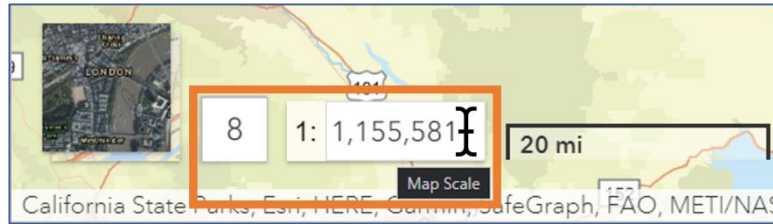
Scale Bar:

Map scale is expressed as a ratio of units onscreen to units on the ground. For example, a map scale of 1: 1,000 would mean that each unit on the map represents 1,000 units on the ground. The map scale bar along the bottom left of the map next to the map scale box shows the current map scale in miles.

Toggle Basemap:

The bottom left of the map viewer contains a button to quickly toggle between two commonly used basemaps. It consists of two thumbnails, one representing the active basemap which is currently shown in the map, and the inactive, representing an alternative basemap. The button displays the inactive thumbnail on top, and the active thumbnail beneath. When the basemap is changed the active thumbnail is updated. To change the inactive option first make it active by clicking the button and change it using the Basemaps Tool. When the viewer is first open, these options are preset to imagery with labels (inactive) and topography (active).

Click to toggle between commonly used basemaps

Results Table:

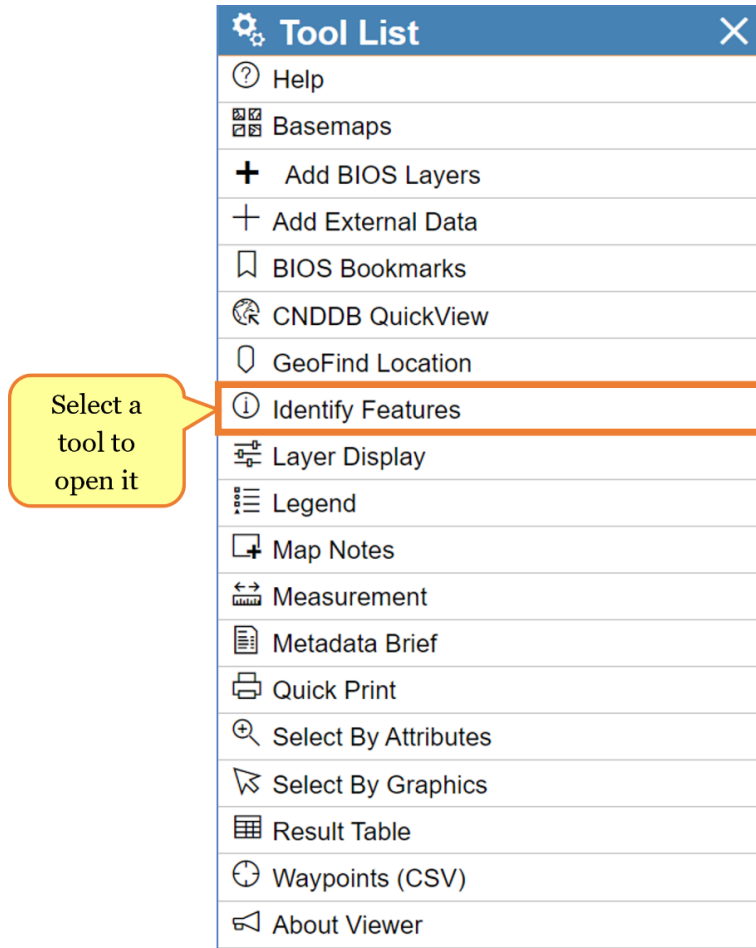When you select a feature by using the *Identify*, *Select By Attributes*, or *Select By Graphics* tools, valid results will be displayed in the **Results Table**. The table appears at the bottom of the Map Canvas. If closed, the table can be accessed from the *Tool List* using the *Results Table* Tool or from the **Contents** panel, under the **Graphics Layers** section, using the *Display attributes selection* button.

There are a variety of ways to interact with the data in the Results table. For example, you can download the table contents (saved as a .csv), print the results to a PDF, or zoom the map frame to a specific record.

	OBJECTID	Hex_ID	Ecoregion Biodiversity Rank	Sci_Name	Com_Name	Observation	Model	Rare	CWHR_code	
1	20089	41760	1	Anaxyrus punctatus					AAABB01120	A036
2	20089	41760	1	Elanus leucurus	ki				ABNKC0601	
3	20089	41760	1	Buteo swainsoni	swainson's hawk	N	Y	Y	ABNKC1907	
4	20089	41760	1	Buteo lagopus	rough-legged hawk	N	Y	N	ABNKC19130	B125
5	20089	41760	1	Geococcyx californianus	greater roadrunner	N	Y	N	ABNRB0902	

Terrestrial Species List - ACE [ds2700] *(1 features)* (96 related records)

(callouts: Zoom to selection; Print table to PDF; Download table; Expand table; Close table; Scroll bars)

Tools List:

All tools are available in a single Tools menu that you access from the **Tools** button at the top right of the **Banner** in the viewer.

Tool List

- Help
- Basemaps
- + Add BIOS Layers
- + Add External Data
- BIOS Bookmarks
- CNDDB QuickView
- GeoFind Location
- Identify Features
- Layer Display
- Legend
- Map Notes
- Measurement
- Metadata Brief
- Quick Print
- Select By Attributes
- Select By Graphics
- Result Table
- Waypoints (CSV)
- About Viewer

(callout: Select a tool to open it)

To use a tool in BIOS, you must first select the layer that you want to use the tool on in the Layers tab of the **Contents** panel on the left side of the viewer, making it the Active Layer. Once you have an Active Layer to work with you can select and use your tool. The current Active Layer is indicated by a blue box around the layer name in the BIOS Layers section in the **Contents** panel.

Help Menu:

The **Help Menu** contains a series of helpful links. Use the first link to email the BIOS group with any questions and comments you may have. The BDB Training Page is a great resource for learning more about BIOS and the other programs within the Biogeographic Data Branch (BDB). All the public BIOS data can be downloaded through the download links in the BIOS Viewer. Additionally, all CDFW authored public data can be downloaded through the CDFW Opendata Portal as different file formats.

Basemaps Tool:

Changing the basemap can make some data easier to see and provide some context for the data. The basemap can be changed through the **Basemaps** tool. You can change the background map to a number of other options. A panel opens with a series of thumbnails; click on an image of the basemap that you would like to use, and you will see the map update to display the basemap that you have selected.
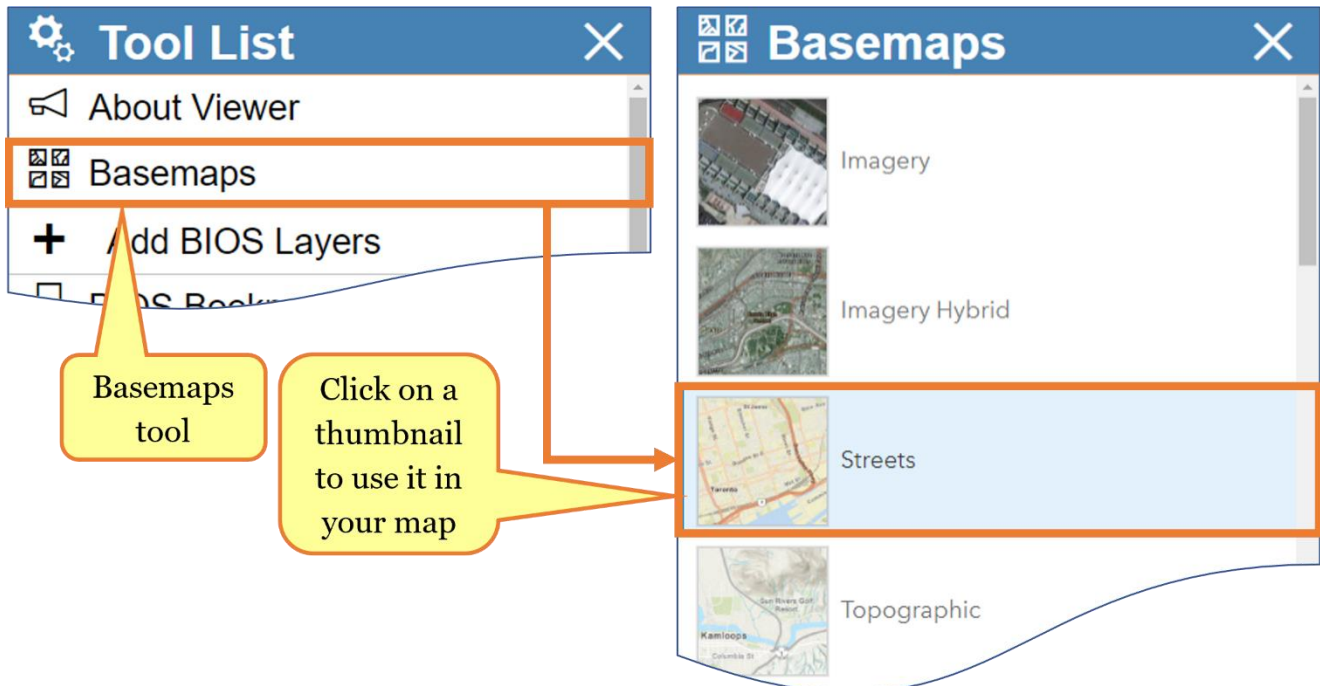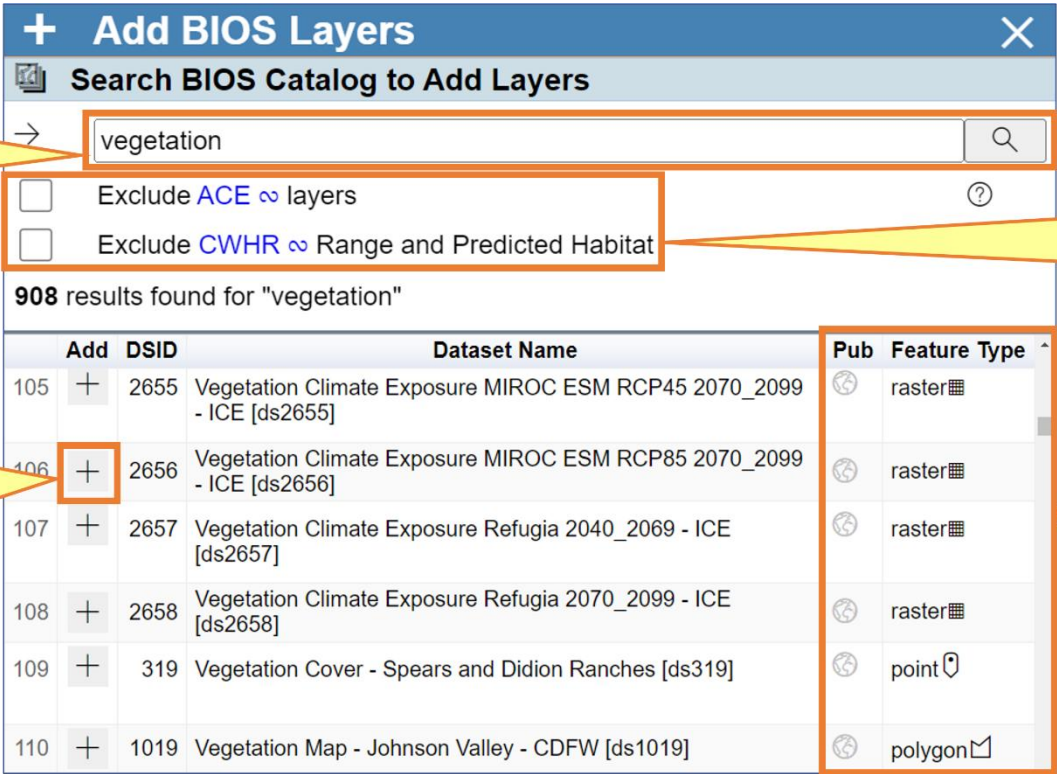
Map choices include imagery, street maps, topographic maps and several years of NAIP imagery, among other options. The default basemap that is loaded when the viewer opens is the ESRI World Topographic Map.

Add BIOS Layers Tool:

To begin adding data from the BIOS library of data, open the **+ Add BIOS Layers** tool. Click in the search box and enter your search terms then press [🔍] or Enter/Return on your keyboard. A results list will appear showing you all the available data layers. Scroll through the list and select the layers that you would like to add. The results can be reordered by clicking on a header to sort alphabetically (first click is ascending, second is descending).

You can type the name of the dataset that you would like to add in the search box, enter a search term such as a dataset number (ds#), or a species name. Be sure to press the search button (or press Enter/Return) to refresh the search results after editing the search criteria. Search results can be limited by excluding two large groups of data, Areas of Conservation Emphasis (ACE) and California Wildlife Habitat Relationships (CWHR) layers.

Clicking on the Add Layer button [+] in the search results will add the layer to the **Contents** panel, BIOS Layers section; once added the button will change to a checkmark [✓].

Add External Data Tool:

This tool allows you to add data from a publicly accessible external location by entering the URL. Layers added from this tool will appear in the External Layers section of the **Contents** panel. There are five data source types which are accepted: Feature Layers, Map Services, Comma Separated Value (CSV) files, KML/KMZ files, and Web Map Services (WMS).

To add an external dataset, first choose the data source type, then enter the ArcGIS Online (AGOL) item ID/URL in the first text box. A label can be provided in the Enter Layer Label text box; this name will appear in the External Layer section of the **Contents** panel.

Each data type requires a public URL or ArcGIS Portal item ID. All data paths must be public URL addresses, including the HTTPS extension. Public data can also be accessed through ArcGIS Online, an account for which can be created for free. Currently BIOS does not support accessing data in Google Drive, Drobox, or FTPs.

A sample external dataset can be viewed for each data type. First specify the data type, then press the Add sample button; an example URL and label will be filled in. Press the Add Data button to view the sample data in BIOS. The sample URL can be visited by pressing the blue URL link, adjacent to the Add sample button.


Some of the data added with this tool have limitations. The data types CSV, KML/KMZ, and WMS are not available to the BIOS tools (cannot be made active) and the symbology

legend is not available. This data can only be displayed in the map frame. Feature Layers and Map Services are available to use with the BIOS tools.

BIOS Bookmarks Tool:

This tool saves the location and layer information for the current map session. The bookmarked BIOS map session can be reloaded later or on a different computer by using this tool to Browse for existing Bookmarks or by opening the URL provided after the Bookmark is created in an internet browser such as Firefox or Chrome.

The map extent, added BIOS layers, external data layers, the current active layer, map notes, layer filters, and query statements created from the *Select By Attributes* tool are retained in the bookmark. Additional items are planned to be saved with a bookmark in the future.
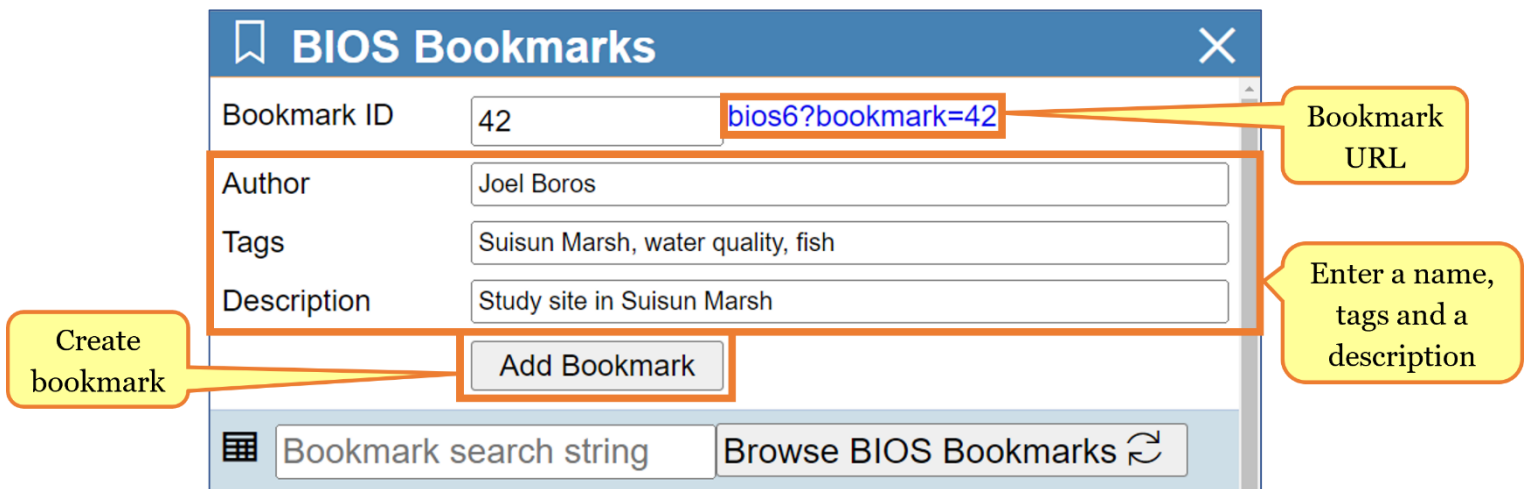
The tool has three parameters: author, tags, and description. This information can be used to find your bookmark in future BIOS sessions. Once the information is entered, press the *Add Bookmark* button to create the bookmark. A URL will appear on the right side of the Bookmark ID box. This URL can be saved so that the bookmark can be accessed later, on another device, or shared with a colleague.

To begin browsing for previously created bookmarks click on the **Browse BIOS Bookmarks** button. A list of all available bookmarks will be returned. To narrow the results, use the text box adjacent to the **Browse BIOS Bookmarks** button. Enter any of the information from your bookmark (author, tags, description). Once you have found a bookmark that you are interested in, press the Open link to open the bookmark in another tab in your browser.

- ***NOTE: If you include secure data layers in your bookmark anyone that opens the bookmark will be prompted to log in. If the person opening the bookmark does not have the appropriate permission to view the secure data layers they will be removed from the session before it opens in the viewer.***

CNDDB Quick Filter Tool:
This tool allows you to quickly filter the commercial or government version of the CNDDB data; a CNDDB subscription is required for this tool.

This tool will only appear in the **Tool List** when either California Natural Diversity Database (CNDDB) - Government [ds45] or California Natural Diversity Database (CNDDB) - Commercial [ds85] layer is added to a BIOS session and is made active.
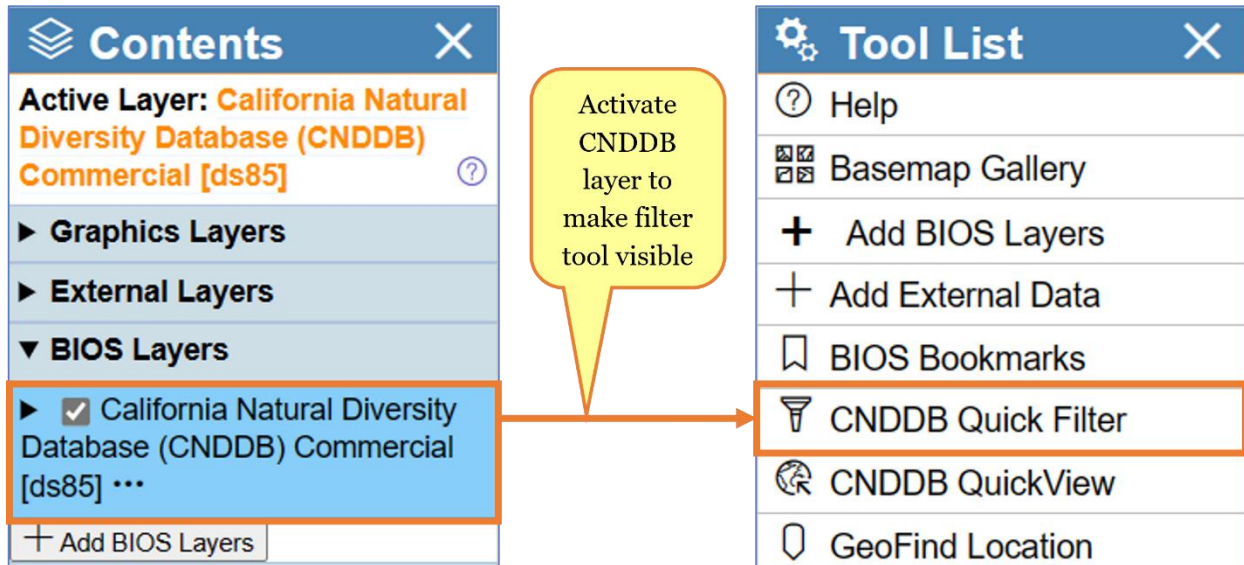
This tool allows the CNDDB data to be filtered to only display specific taxonomic groups. Any selections on those filtered data will only return results for those specific taxa. Selecting a group will filter the data. To remove a filter, select "None".
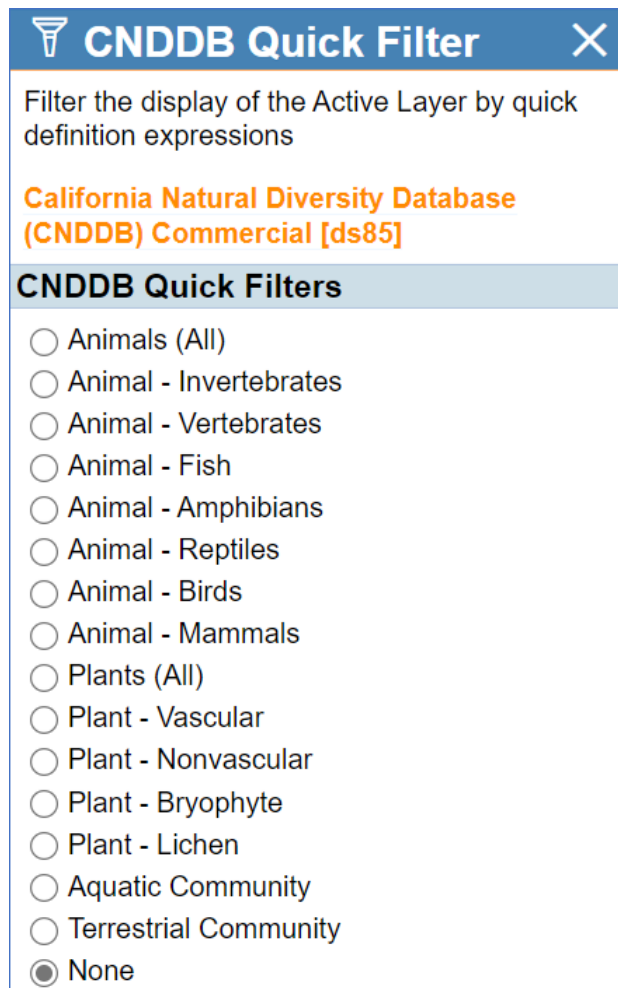
CNDDB QuickView Tool:

The **CNDDB QuickView** first opens with a brief description of the tool and includes a few helpful links. To open the tool parameters, click on the *Open tool* button.
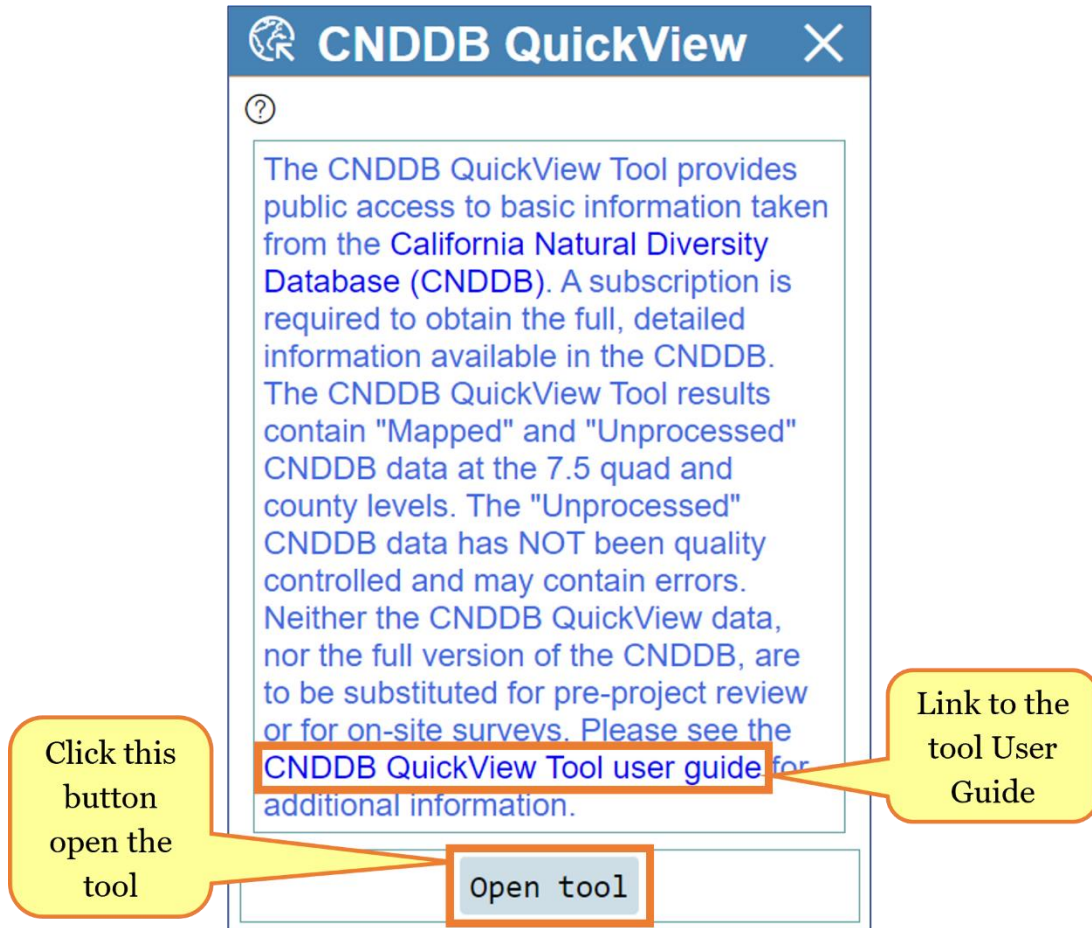
A panel will open on the right side of the viewer displaying the **CNDDB QuickView** tool interface. The drop-down list allows you to choose a quad and zoom the map into that area. Below you will see three methods with which you can generate a list of special status species.

Open the tool description

Select a Quad to zoom to

Select method to list species
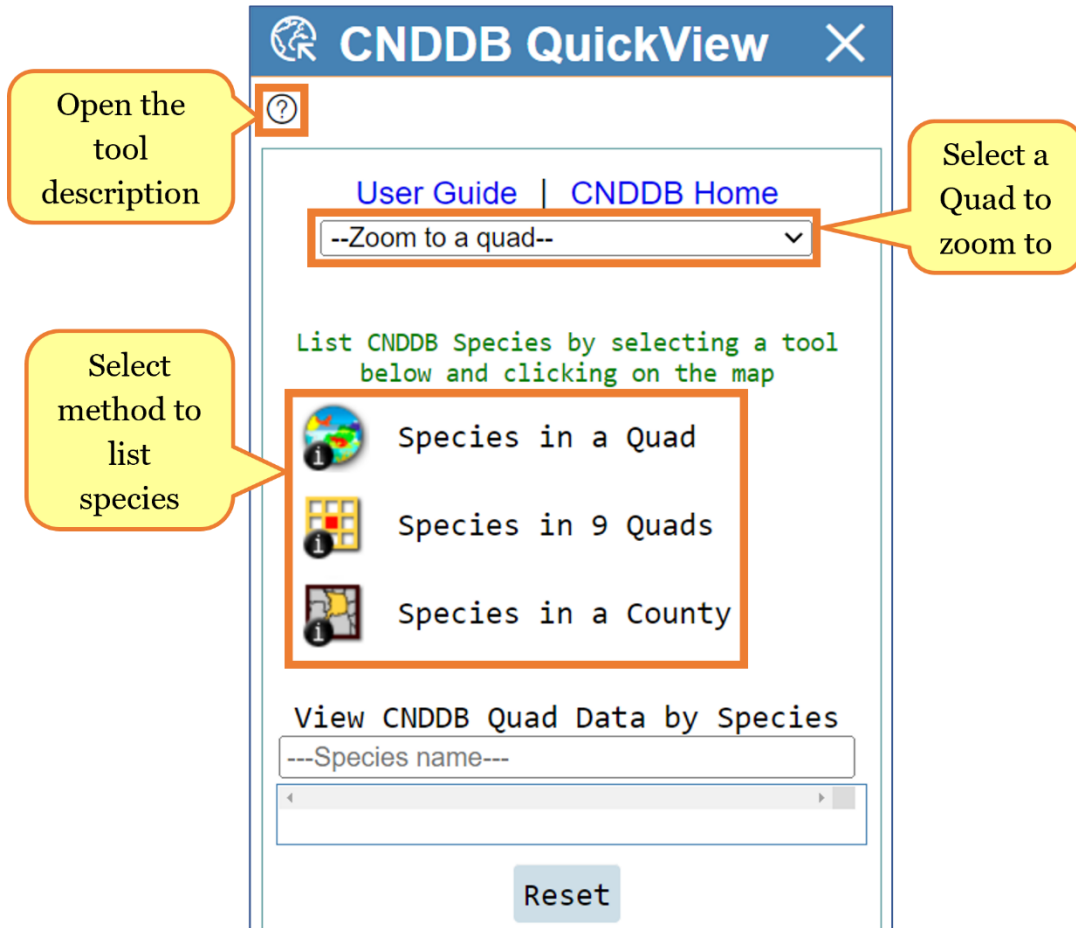
To generate a list of special status species for one quad, first choose the method **Species in a Quad**. Next, click within the map and a quad will be selected in the map and a list of all the species currently mapped into the CNDDB or in the unprocessed data files of the CNDDB that are in that quad will be returned in the table results panel.

If you select the **List CNDDB Species for 9 Quads** method and click within the map, the quad that you clicked on will be selected as will all the quads that adjoin it. A list of all the species currently mapped into the CNDDB or in the unprocessed data files of the CNDDB that are in the quad that you clicked and those found in all the quads that adjoin it will be returned in the table results panel.

If you select the **List CNDDB Species for a County** tool and then click in the map, the county that you click on will be selected in the map and a list of all the species currently mapped into the CNDDB or in the unprocessed data files of the CNDDB that are in that county will be returned in the table results panel.

	Element_Type	Scientific_Name	Common_Name	Element_Code	Federal_Status	State_Status	CDFW_Status	CA_Rare_Plant_Rank	Quad_Code	Quad_Name	Data_Status	Taxonomic_Sort
1	Animals - Birds	Buteo swainsoni	Swainsons hawk	ABNKC19070	None	Threatened	-	-	3912136	GRIDLEY	Mapped and Unprocessed	Animals - Birds - Accipitridae - Buteo swainsoni
2	Animals - Birds	Haliaeetus leucocephalus	bald eagle	ABNKC10010	Delisted	Endangered	FP	-	3912136	GRIDLEY	Mapped	Animals - Birds - Accipitridae - Haliaeetus leucocephalus
3	Animals - Birds	Ardea alba	great egret	ABNGA04040	None	None	-	-	3912136	GRIDLEY	Unprocessed	Animals - Birds - Ardeidae - Ardea alba

Another function of the **CNDDB QuickView** tool is highlighting quads where CNDDB has mapped and unprocessed information on a specific special status species. Begin by entering a scientific or common name into the View CNDDB Quad Data by Species search box. As you begin to type, a results list will suggest species, select the result which matches the species you are searching for. Once selected, information on the special status of the species will be displayed beneath the search box, including the number of quads in which the CNDDB has mapped occurrences and unprocessed data. Quads are symbolized in two ways; purple indicates there are mapped CNDDB occurrences, and stone blue represents the unprocessed data.

GeoFind Location Tool:

This tool provides several options for finding a location on the map. Use the Locate By drop-down list to select the method that you would like to use; each method has a different set of parameters. Some methods have additional help provided which can be accessed by clicking the Help link on the bottom left of the tool.

Some methods have additional help

Select the method
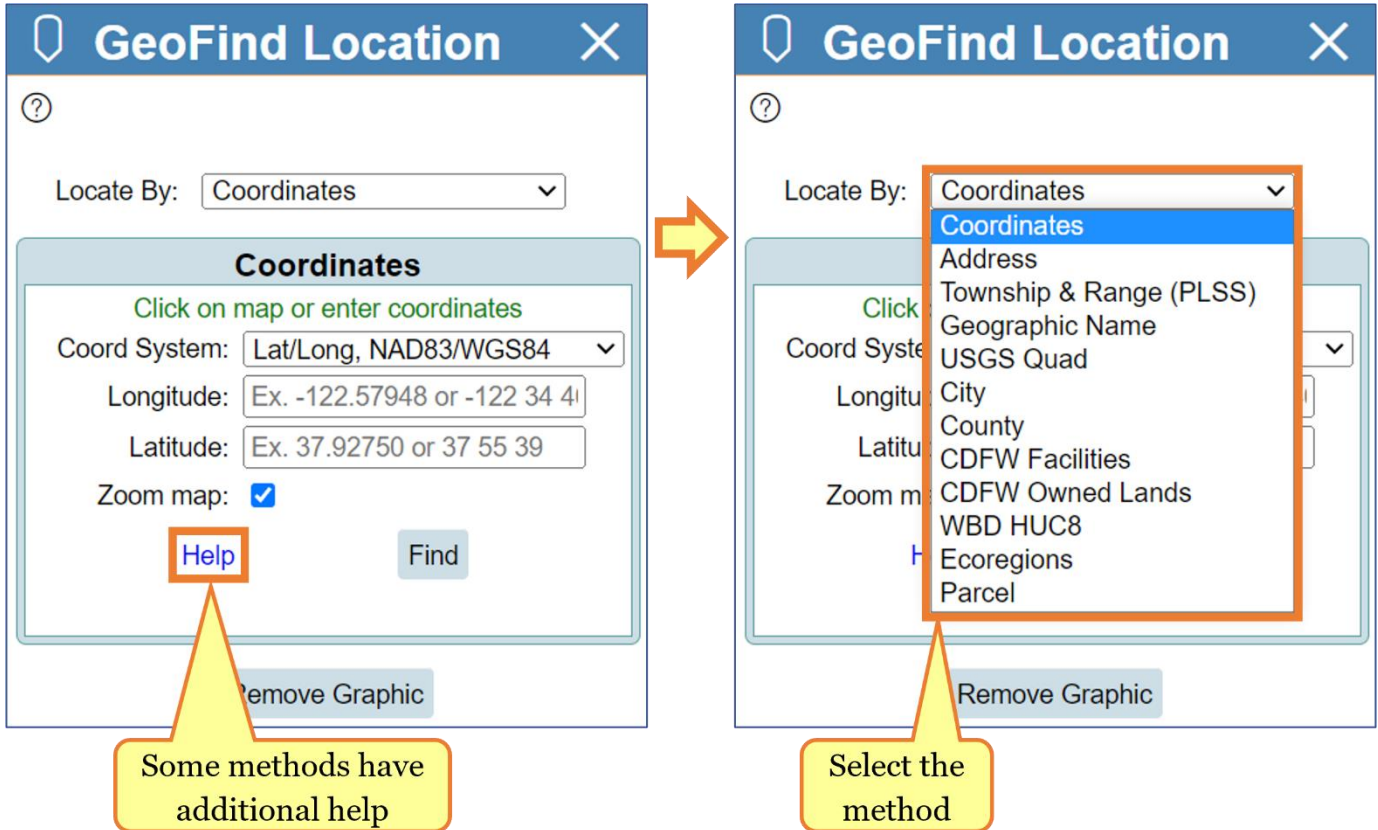
The location options are:

1. ***Coordinates***: Find a location on the map by entering coordinates in Geographic (Latitude/Longitude) or UTM formats. Click the **Find** button and the map will redraw zoomed in to the specified location.

2. ***Address***: This option allows you to enter a partial or complete street address and zoom to it on the map.

3. ***Township and Range*** (PLSS): Select your Township, Range and Section values and specify the appropriate meridian using the drop-down lists. When you click the **Find** button a list of results matching your criteria will open in the Table. You can zoom the map to one of the locations listed by clicking the **Go** button in the Zoom To field.

4. ***Geographic Name***: This option will allow you to search for a place or geographic feature by searching the USGS Geographic Names Information System (GNIS) database. This database contains location references to all text that appears on all USGS quad maps. A record for each result that matched or

partially matched your search criteria will be displayed in the Table panel at the bottom of the viewer window. For example, a search of "Folsom" will return locations like the City of Folsom, Folsom Dam, Folsom Lake, etc. You can zoom the map to one of the features listed by clicking the **Go** button in the Zoom To field.

5. *USGS Quad*: Choose from a list of 1:24,000-scale (24K), 7.5-minute by 7.5-minute Quadrangle maps from the U.S. Geological Survey and zoom to the boundary of the specified Quad.

6. *City*: Select a city of interest from the drop-down list provided and zoom to it by clicking the **Find** button.

7. *County***:** Select a county of interest from the drop-down list provided and zoom to it by clicking the **Find** button.

8. *CDFW Facilities***:** Choose from a drop-down list of California Department of Fish and Wildlife offices and facility locations and zoom to it by clicking the **Find** button.

9. *CDFW Owned Lands***:** Choose from a drop-down list of properties that are owned and/or administered by the California Department of Fish and Wildlife. Click the **Find** button to redraw the map zoomed in to the specified property.

10. *WBD:* (Watershed Boundary Dataset) *HUC8***:** Use this option to select a watershed boundary at the Hydrologic Unit (HU, major rivers) level from a list compiled from the United States Geological Survey (USGS), National Hydrography Dataset (NHD). Click the **Find** button to zoom the map in to the specified Hydrologic Unit.

11. *Ecoregions***:** Use this option to select an Ecoregion from a list derived from Ecological Unit Sections for the state of California as described by ECOMAP (1993), United States Department of Agriculture, Forest Service. Click the **Find** button to zoom the map in to the specified Ecoregion.

12. *Parcels:* Select this method to either return the Assessor's Parcel Number (APN) for a parcel or zoom to a location based on the APN. To view the APN, enter the address into the search box, then press the **Search** button, or locate a property within the map frame and click on it. To find a location based on the APN, enter number with or without dashes in the search box at the bottom, then click the **Find** button **(Note: a minimum of 6 digits are required).**
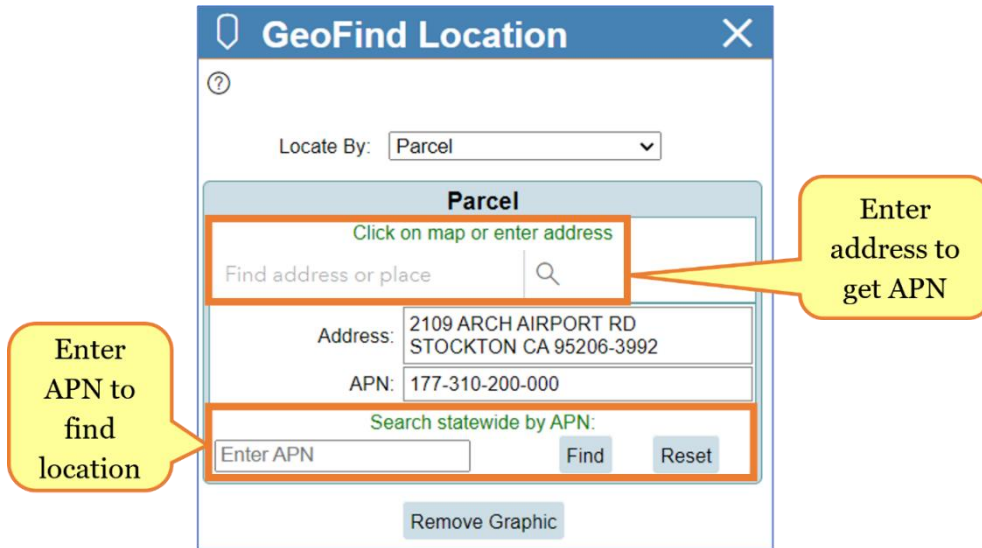
Once the location of interest has been found, the symbology can be removed by pressing the Remove Graphic button Remove Graphic.

In addition, this tool can be used to get basic information about a location in the map, including various coordinate formats, county, and quad. To view this information first open the tool, then click a location within the map. The information will be displayed at the bottom of the tool panel.
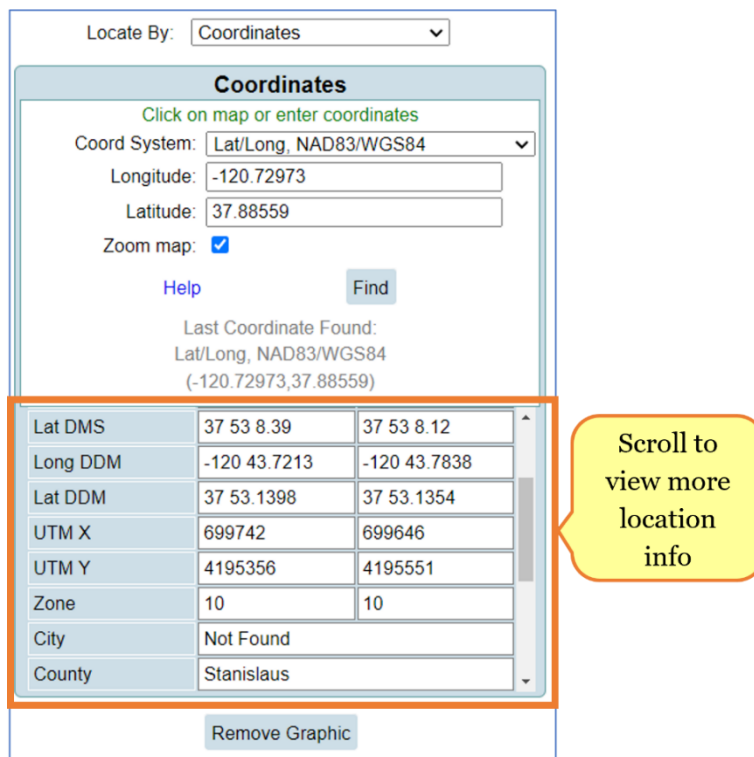
- *NOTE basic geographic reference information displayed below the potential street address found comes from data layers limited by the California state boundary, so results may be incomplete or unavailable if you click on a map point outside of California.*

Identify Tool:

This is the most common interactive map tool and the most familiar to most users. Select the tool and click on a feature in the Active Layer and the attribute data for the feature identified is displayed in the results table bottom of the viewer window. In addition, a summary of the identified feature is also listed in the tool panel.
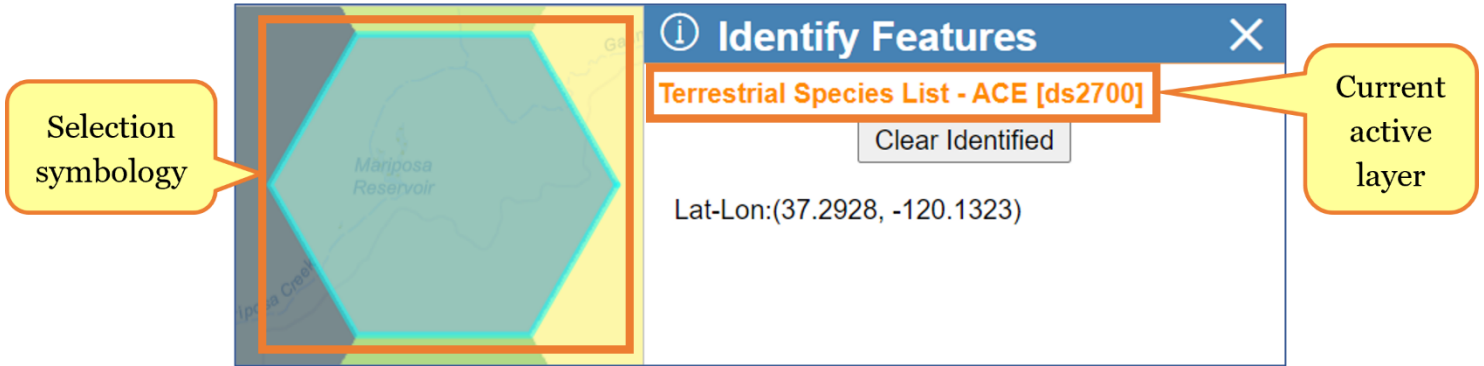
If the Identify Features tool finds multiple features at a location a record for each feature will be made available in the results table. A scroll bar will also appear at the bottom of the table if the number of columns exceeds the width of the viewer window. Use the scroll bar to view the additional information.

Layer Display Tool:

The transparency/opacity of a layer can be adjusted using the *Layer Display* tool. By default, BIOS layers are set with a 23% transparency. More layer display functions are planned for the future.
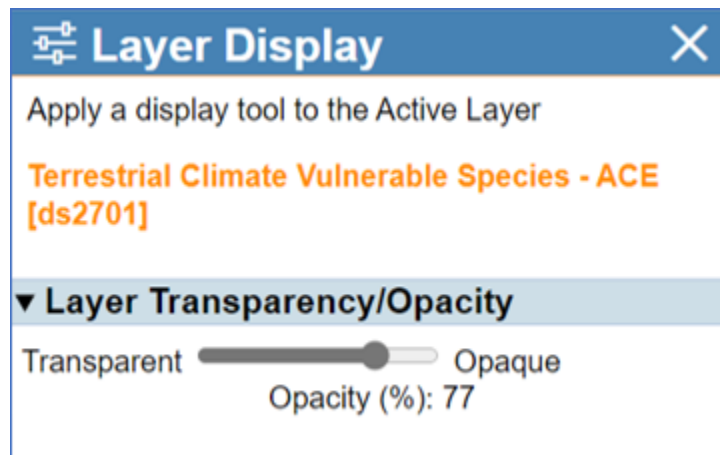
Legend Tool:

The *Legend Tool* allows you to view the symbology used to display all currently active layers in a BIOS session. This includes any currently visible external layers (feature layer and map service formats), BIOS layers, and reference layers.

Legend

Biosds2740 cpu

Aquatic Species List - ACE [ds2740]

- 5 - high
- 4
- 3
- 2
- 1 - low
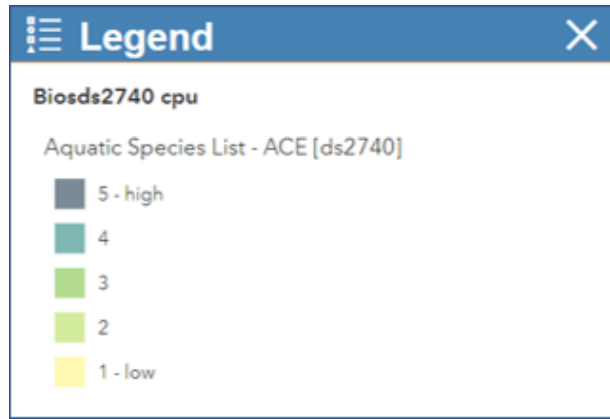
Map Notes Tool:

Sketches and labels can be drawn and written in the map frame using the **Map Notes Tool**. Points, lines, and polygons can be drawn, each with their own label.

Map Notes

☑ Show Map Notes

Use the **Editor** menu below to create, edit, or delete graphics and labels on the map.

Editor

Edit features

Select

Toggle visibility of map notes

Click then select a sketch to edit

Create features

Sketch Points

◆ New Feature

Sketch Lines

— New Feature

Sketch Areas

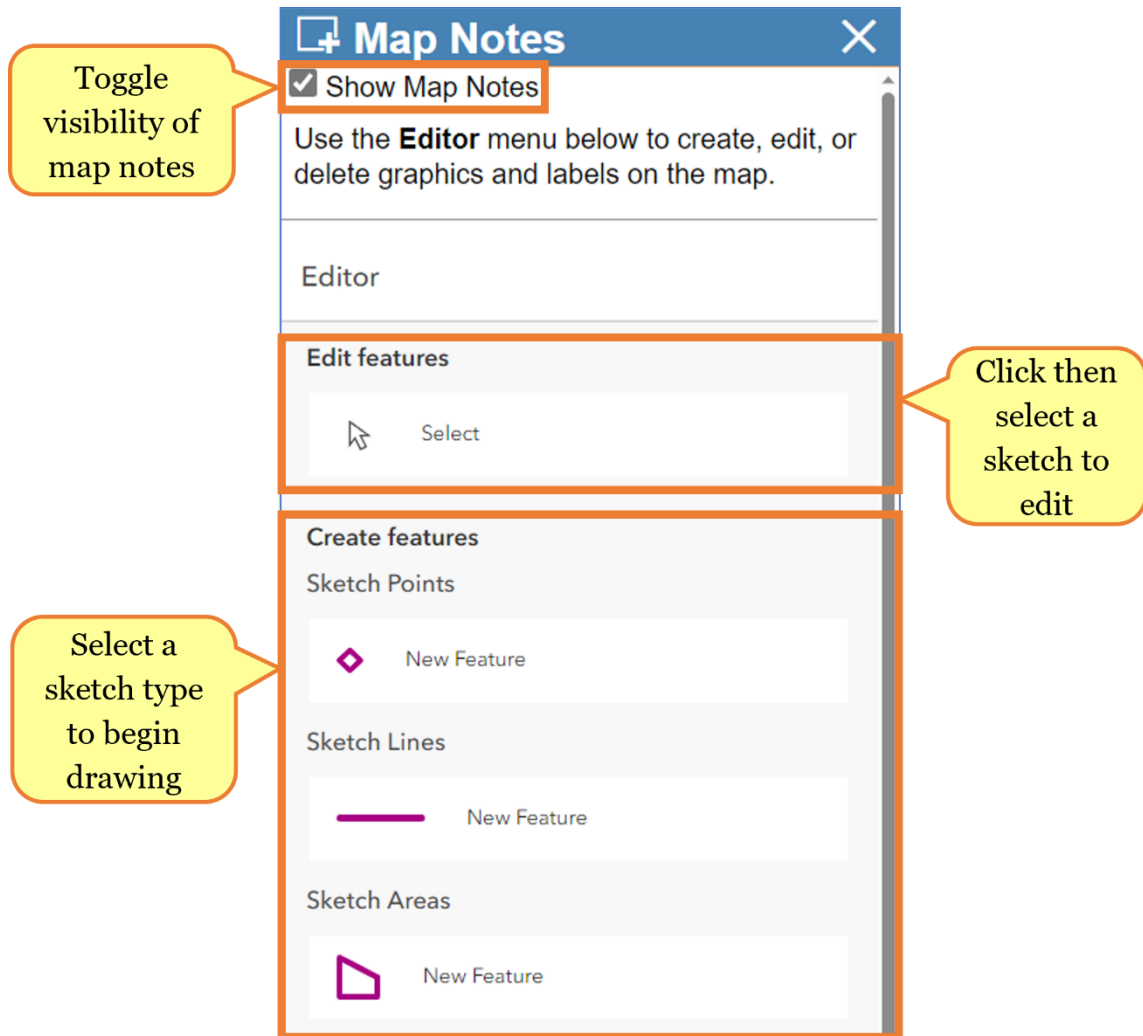◻ New Feature

Select a sketch type to begin drawing

Map notes can be toggled on and off in the tools panel. After a note has been created, it can be edited or deleted, using the Select method. All map notes can be deleted by clearing your web browsers cache (shortcut: CMD/CTRL + Shift + Delete). Otherwise map notes persist in the web browser but are only visible on the computer and browser they

were created on. Notes can be made permanent and shared by creating a bookmark using the **BIOS Bookmarks Tool**.

To begin creating a map note click one of the sketch methods. You can specify an author, label, name, and comments for each note. The label text will appear in the map adjacent to the sketch. The other information can be viewed by selecting a map note.

Enter information for each sketch

Create new sketch

Update or delete note when editing
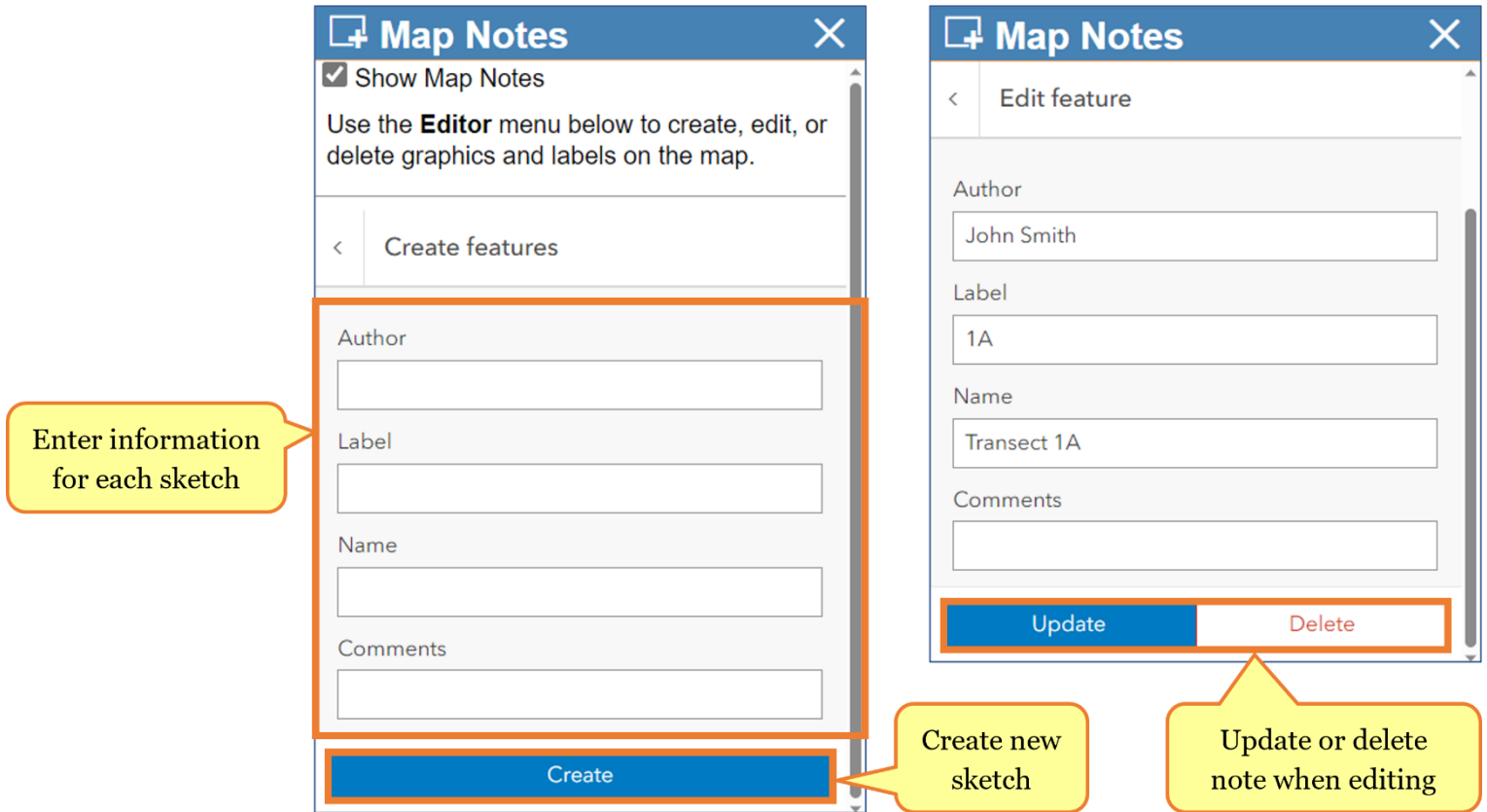
A sketch can be selected to view or update the associated notes and/or make changes to the sketch. Chose the **Select** method, then click on the map note you wish to view or make changes too. To make changes to the notes, simply update any of the information in the text boxes in the tool panel. Once selected, you will notice an orange box on the sketch in the map frame. To resize the sketch, click and drag on one of the hand holds (squares); to rotate, click and drag on the circle (top center). Additionally, vertices can be moved or added to a sketch. Click on a sketch in the map frame (while editing) to change editing modes, the orange box will change to orange circles at each of the vertices. To adjust the shape, click and hold one of the orange vertices to move them. To add vertices, click on a white circle, which then changes it to an orange vertex.

Click to toggle
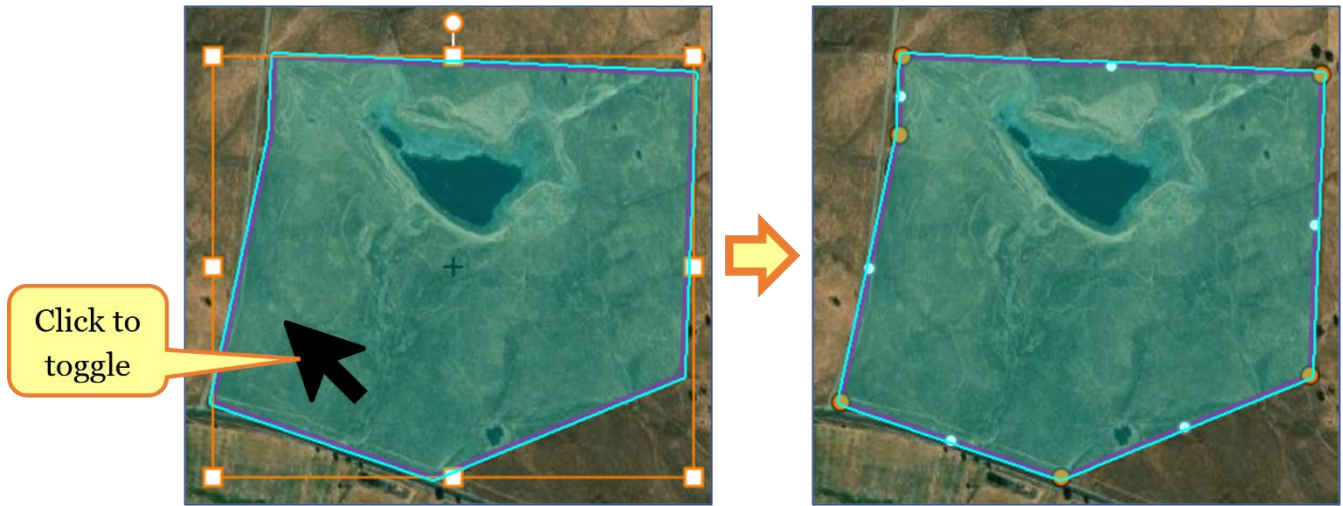
- NOTE this is a simple markup tool, not meant to store a lot of notes, and the symbology of the map notes cannot be changed.

Measurement Tool:

A linear or area measurement can be made using the ***Measurement Tool***. Choose the ***Distance Measurement*** method to measure a length or select the ***Area Measurement*** method to calculate an area. As you click a point (vertex) will be added in the Map Canvas, you will see your line or polygon drawn in the map. Click once to add a point to the line or polygon and double-click to end the line or close the polygon. Measurement Results will be displayed at the bottom of the ***Measurement Tool*** panel on the right-side panel of the viewer. To change the measurement units, select the preferred unit from the ***Unit*** drop-down menu; the measurement will automatically update to reflect this change.

Measure length or area

Clear measurements

Select unit
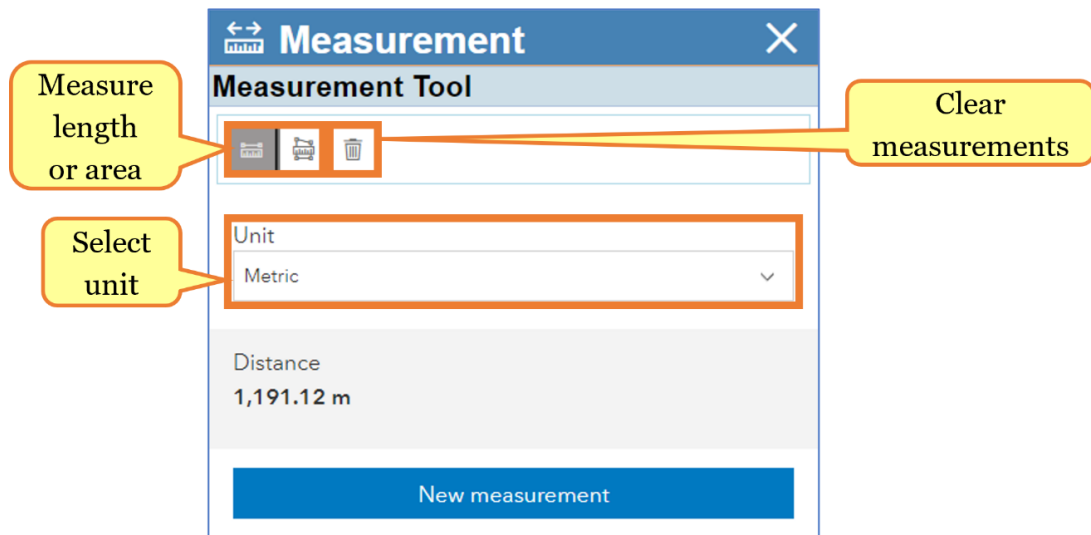
The measurement line or polygon can be edited by left-clicking one of the vertices; move it to your desired location and the distance will update once again.

To clear all measurements, press the ***Clear Measurements*** button . To start a new measurement using the currently selected method (distance or area), press the ***New measurement*** button.

Metadata Brief Tool:

Another way to open the **Metadata Brief** panel is by selecting it in the **Tool List**.

Quick Print Tool:

To quickly print a map, open the **Quick Print** tool. By default, all currently visible layers in the BIOS session will have legend information in the printed map. The legend can be limited to only that of the active layer. To do this, check the box next to "Show Active Layer Legend Only".

The printed map will display the current extent of the **Map Canvas**. This can be increased by closing the **Contents** panel. This can be quickly done by selecting the "Wider" option in the "Choose map image style for print" section.

When ready, press the **Preview Quick Print** button to open a preview of the printed map. The preview window will appear over the map which includes a title, image of the current map extent (with currently visible layers), a map scale bar, a description, the current date, and the map legend. The title and description can be edited by first clicking on the text. Once edits have been made and you are ready to print, press CTRL+P on your keyboard or navigate to your browsers print function and select the option to print to PDF.

Check to include legend for active layer only

Click to open preview page
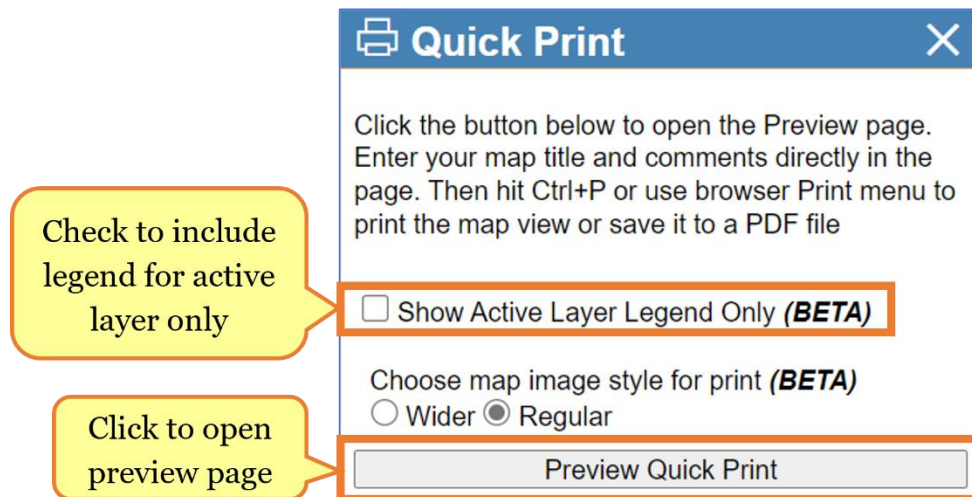
Spotted Owl Reports Tool:

This tool is used to generate two reports on the Spotted Owl (SPOW) Database, ***Spotted Owl Sites Found*** and ***Observations Reported***; a <u>CNDDB subscription is required for this tool</u>. Once the tool is selected, several data layers are automatically turned on, Spotted Owl Observations (ds704) and PLSS (Public Land Survey System). To make a selection, first locate an area of interest by either panning and zooming or use the ***Zoom to a PLSS*** function. Then press the ***PLSS Select Tool*** button ⬚. This tool will allow you to draw a polygon to select the PLSS sections. Click to create each vertex (point) of the polygon, then double-click to finish drawing.
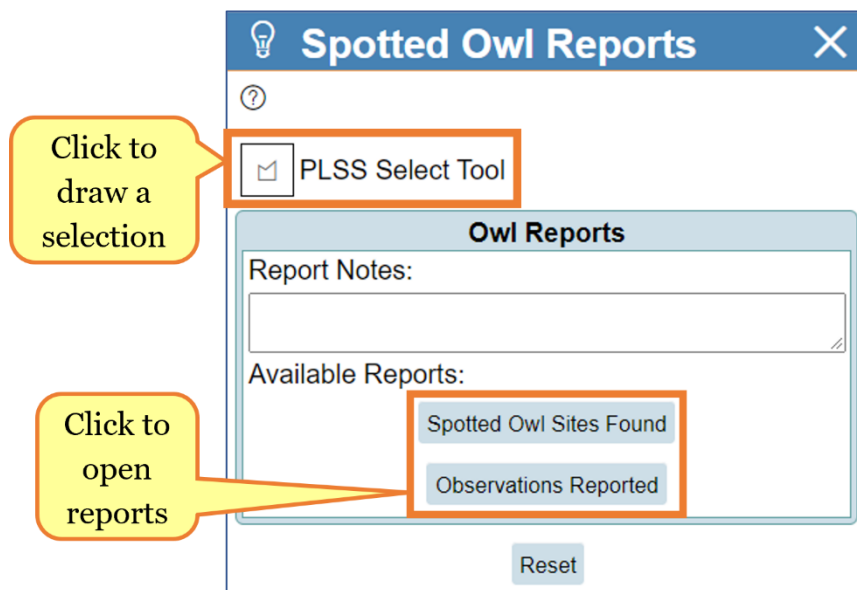
Notes, comments, or location descriptions can be entered into the Report Notes section. These notes will appear on the cover page of the report. If left blank, no notes will appear.

Once a selection has been made, click on either of the reports under the ***Available Reports*** section. Depending on your browser and its settings you will be prompted to open, save, or show your download(s).

Select By Attributes Tool:

This tool allows you to compose a conditional query that will be applied to the Active Layer. Features that meet the criteria defined in the query will be returned as a selected set in the viewer. You will see them highlighted in yellow on the Map Canvas and the selected records will be returned in the ***Results Table***.

A conditional statement is comprised of three components: **fields**, **operators**, and **values**.

1. *Fields List:* Listed in the attribute field drop-box (labeled **--SELECT ATTRIBUTEFIELD--**) are all the fields in the Active Layer. These are the fields that you can choose from to build a query. Selecting a field name in the list will add that field to the Query Command box at the bottom, where you will build the query command.

2. *Operators:* Select one of the operators from the drop-down field (labeled **--OPERATOR--**) to add it to the Query Command box at the bottom to include as part of your conditional statement.

Table of Operators:

| Operator	Description [Symbol]	Example Query
Equals	Returns record(s) which equal a value [=]	Name **=** 'mount Whitney'
Not Equal	Returns record(s) which do not equal a value [<>]	Name **<>** 'mount Whitney'
Less than	Returns record(s) which are less than a value [>]	Elevation **< 400**
Less or Equal	Returns record(s) which are less than or equal to a value [<=]	Elevation **<= 400**
Greater than	Returns record(s) which are greater than a value [>]	Elevation **> 14000**
Greater or Equal	Returns record(s) which are greater than or equal to a value [>=]	Elevation **>= 14000**
LIKE	Used to find a record(s) with a portion of text, with a wildcard '%' [LIKE '%%']	Name **LIKE '%**whit**%'**
IN (List…)	Returns record(s) that match a list of values [IN ()]	Name **IN (**'mount Whitney', 'mount tam', 'mount Shasta'**)**
Is Null	Returns record(s) with a null value [IS NULL]	Name **IS NULL**
Is Not Null	Returns all record(s) except those with a null value [IS NOT NULL]	Name **IS NOT NULL**
Is Not Blank	Return(s) all records which are not blank and not null [<> '']	Name **<> ''**

3. *Values:* Listed in the Field Values drop-down menu (labeled *--FIELD VALUE(S)--*) are all the unique values that occur in the field you last selected. Click on a field value to add it to the Query Command box. Find or filter the values using the **Find/Filter field values by** search box; enter in part of the value which appears in the list then press the search button 🔍. You can also manually enter a value in the Query Command by typing it into the box.

You can link together conditional statements to form a more complex query using connectors.

Table of Connectors:

Connector	Description	Example Query
AND	Returns records where _both_ statements are true	Elevation > 14000 **AND** Name = 'mount Whitney'
OR	Returns records where _either_ statement is true	Elevation < 100 **OR** Name = 'mount Whitney'

Below the Query Command box there is the option to either create a selection or a create a filter. To create a selection, use either **Query New Selection** or **Query Within Selection** buttons. The **Query New Selection** option will create a new selection, overriding any existing selections on the active layer. The **Query Within Selection** option will create a sub-selection of those already selected features.
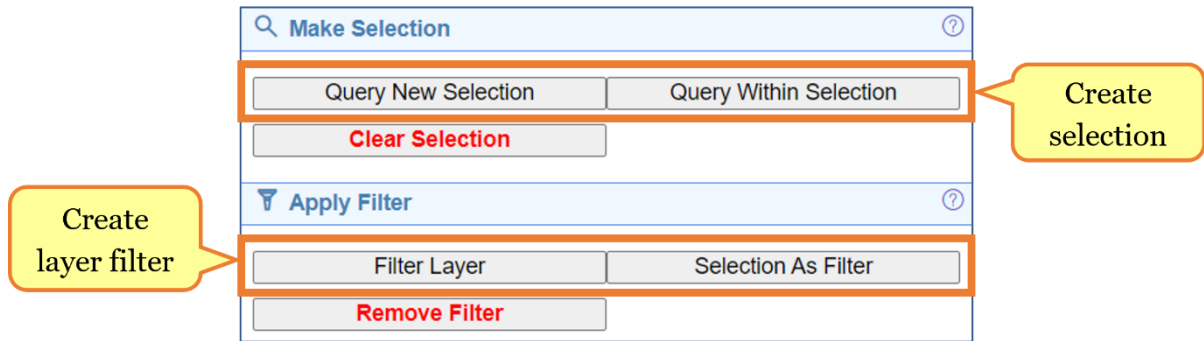

A layer filter can be applied to selectively limit the data within a layer, for example to display observations of a single species from a multi-species dataset. You can apply a layer filter by using either the **Filter Layer** or **Selection As Filter** buttons. The **Filter Layer** option creates a new layer filter, which overrides any existing layer filters on the active layer. The **Selection as Filter** option works similarly to the **Query Within Selection** option, a new layer filter is created on the currently selected features. Selections and filters can be cleared by using their respective buttons.

Select By Graphics Tool:
You can use the **Select by Graphics** tool to create a highlighted subset of data from a data layer. A panel will open on the right side of the viewer offering you a choice of selection methods. Either click on the graphic selection method that you would prefer to use or type in coordinates and press the **Select By Location** button.
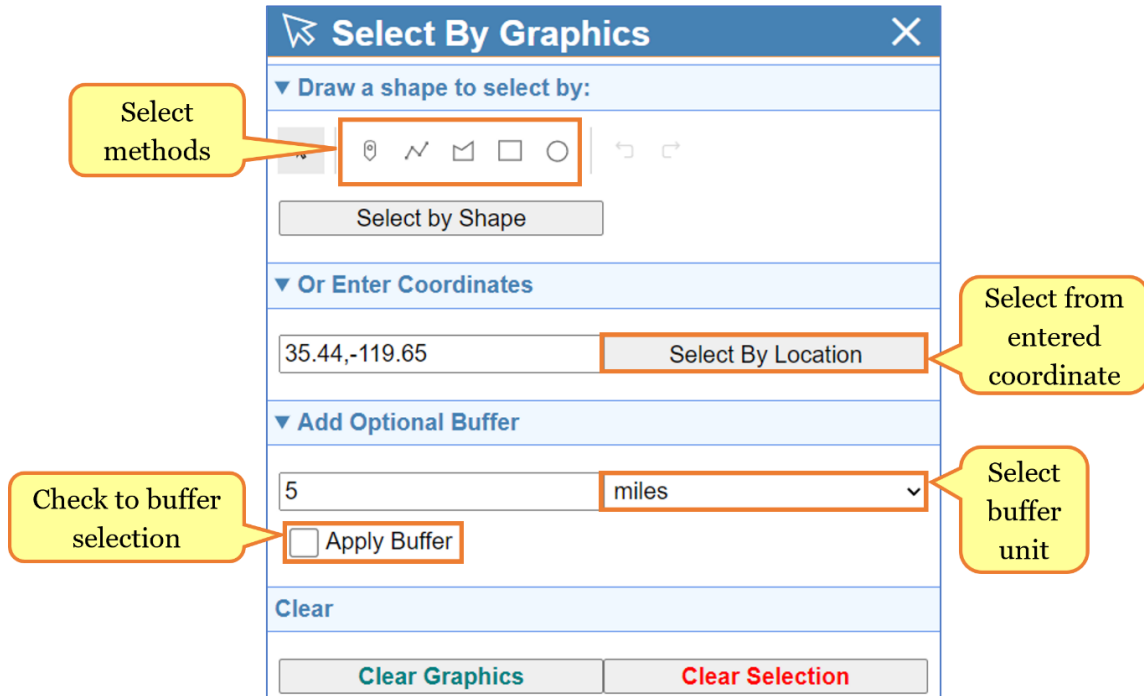
The **Draw a point** method allows you to select features from the **Active Layer** by using the mouse to click on the map. The selected features will be highlighted blue in the map and their attribute information will appear in the **Results Table** at the bottom of the viewer window.

The **Draw a polyline** method allows you to select features from the **Active Layer** by drawing a line. Using the mouse click to place the starting point, click to create another point, and double-click to finish drawing the line. The features which interest the line will be highlighted blue in the map and their attribute information will appear in the **Results Table** at the bottom of the viewer window.

The **Draw a polygon** method selects features from the **Active Layer** by using the mouse to draw a polygon shape around the features to be selected on the map. To begin drawing a polygon, click on the map to create the starting point, then each additional click adds a vertex (point), then double-click to finish the polygon. The selected features will be highlighted blue in the map and their attribute information will appear in the **Results Table** at the bottom of the viewer window.

The **Draw a rectangle** (drag-a-box) method allows you to select features from the **Active Layer** by using the mouse to click on or to drag a box around features in the map. Click (hold down the left mouse button) to begin a corner, then drag to create a box, and release the click to finish. The selected features will be highlighted blue in the map and their attribute information will appear in the **Results Table** at the bottom of the viewer window.

The **Draw a circle** method selects features from the **Active Layer** by using the mouse to draw a circle around the features to be selected on the map. Click (hold down the left mouse button) to begin the circle, then drag to increase the radius, and release the click to

finish. The selected features will be highlighted blue in the map and their attribute information will appear in the **Results Table** at the bottom of the viewer window.

Each of these selection methods creates a selection graphic in the map. A graphic can be selected using the **Select feature** [icon] button. Once selected, a graphic can be edited, adjusting the size and rotation. Then you can reselect the features with the edited graphic by pressing the **Select by Shape** button.
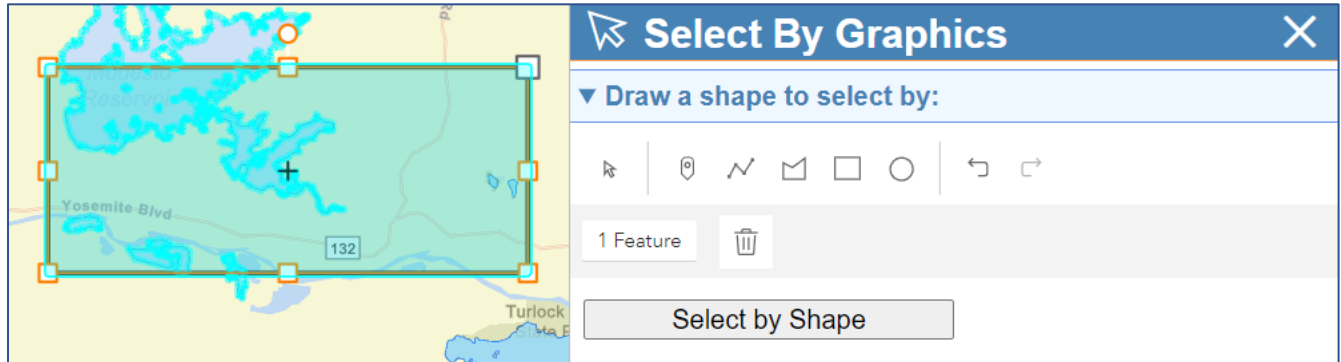
To select features by location, enter coordinates into the search box. To zoom to a location and put a pin symbol on the map canvas, press the **Verify Location** button. To select features at that location, press the **Select By Location** button.

Any selection method (graphic or location) can include an optional buffer. To apply a buffer, check the **Apply Buffer** box, enter a numerical distance in the **Buffer Distance** search box, then select the units from the drop-down list. This information must be set before creating a selection to include a buffer.

The graphics and selections can be cleared individually. To remove the graphics created by the draw tools, press the **Clear Graphics** button. To remove the selection(s), the highlighted blue features and clear the **Results Table**, press the **Clear Selection** button.

Results Table Tool:
This tool re-opens the **Results Table** if closed.

Waypoints (CSV) Tool:
You can load your GPS waypoints into the map using the **Waypoints (CSV)** tool. They must be stored in a comma separated values (CSV) format on your computer for the tool to load them.

Click the **Browse** button and navigate to the waypoints file on your computer. A table will appear in the tool panel that requires you to indicate which fields contain the necessary information; check the box under the field which contains the longitude, latitude, and a field to label to points with. Next, press the **Sample CSV Data** button, if the fields were correctly identified, a sample of the data will appear below the button. To map the points, press the **Map Waypoints** button. The map canvas will then pan and zoom to those new waypoints. To reset the waypoints, press the **Reset** button.

About:

The **About Viewer** window displays the current version of BIOS 6. In addition, basic information about the viewer is available on the BIOS catalog of data, the **Contents** panel, and the tools. At the bottom there are links to the Biogeographic Data Branch homepage and some of the other projects within the branch: Areas of Conservation Emphasis (ACE), California Natural Diversity Database (CNDDB), California Wildlife Habitat Relationships (CWHR), Vegetation Classification and Mapping Program (VegCAMP), and the Biogeographic Information and Observation Systems (BIOS) homepage.

Working with CNDDB in BIOS and RareFind:

Subscribers to the California Natural Diversity Database (CNDDB) can move selected features easily between the BIOS 6 map viewer and the RareFind query tool. In addition to the references below, please see the CNDDB specific tutorial for using CNDDB in BIOS 6.

Once you have added the CNDDB data layer into the BIOS viewer you will see it listed in the **Contents** panel. Zoom the map into your area of interest and click on the CNDDB layer in the **Contents** panel to make it the Active Layer. Use the **Select By Attributes** or **Select By Graphics** tools to select the feature that you are interested in. Once you have records selected you can access the additional tools created to work with this dataset.
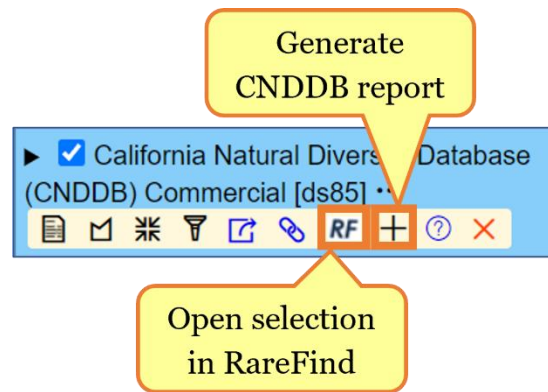
You can view additional information on the CNDDB selections through RareFind 5. This can be accessed in BIOS from the CNDDB layer in the **Contents** panel, click on the three ellipses (…), then click on the **Open Section in Rarefind** button RF or **Generate CNDDB Report** button.

The **Open Section in Rarefind** button passes the currently selected features from the CNDDB layer to RareFind. A new browser window will open allowing you to work with your selected features in the RareFind query tool. In RareFind you can investigate the details for the selected records, refine your selection and find additional report options for the selected data.

Another option is to generate a full PDF report with details for each selected CNDDB feature by pressing the **Generate CNDDB Report** button. You will see a window pop up telling you that the report is being generated. Please be patient, as this process can take a moment or two if you have a large number of selected features.
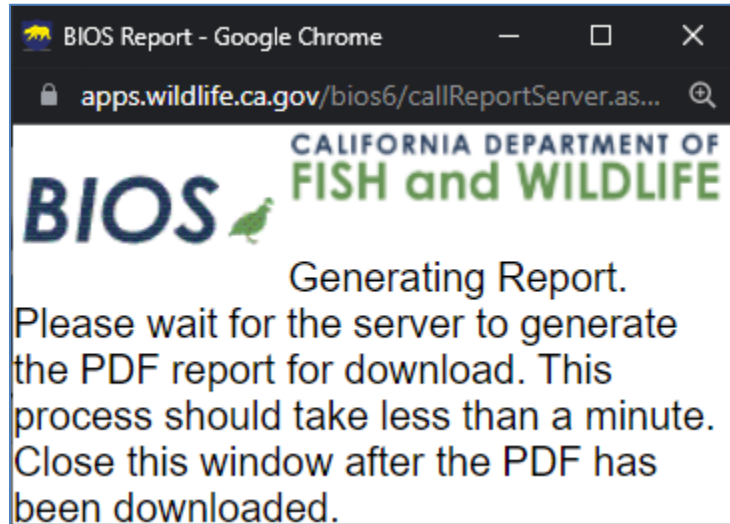
You will see another pop-up window when the PDF of the report is complete offering you a choice between saving the report to your computer or opening it with your PDF reader software.

For additional information on CNDDB and RareFind please visit our training page.

Thank you for using BIOS. Please email us with any comments or questions.